

Federal Home Loan Bank of Des Moines Monthly Price Report

The Federal Home Loan Bank of Des Moines (Bank) is providing estimated valuations for specific Convertible, Amortizing and Non-Amortizing advances set forth below for members' information and convenience only. The estimated valuations are generated by models used for the Bank's own asset/liability management purposes. The models use specific assumptions, for example, market volatility and discount curve adjusted for the Bank's spread, to estimate the value of the advance. **The valuations represent theoretical market prices only and should not be construed as a liquidation price for the specific advance.**

It is expressly understood that in providing these valuations to members, the Bank is not performing any advisory service. The valuations are provided without representation or warranty and the member is solely responsible for any decision it makes or actions it takes based on the valuations provided. It is recommended that members maintain independent capabilities to value their asset/liability positions, including Convertible, Amortizing and Non-Amortizing advances. You should consult with your own tax, legal, accounting, credit and financial advisors with respect to the transaction structure and information detailed herein.

The table depicts valuation estimates resulting from immediate parallel interest-rate movements of plus/minus 400 basis points in 100 basis point increments. To identify your advance, locate the appropriate maturity date and verify the advance rate. The advances in report are grouped by advance type and then within each type sorted in ascending order by maturity date. Once the appropriate structure is located, read across to view the sensitivity analysis for that advance.

If you have any questions, contact the Money Desk at 800.544.3452, ext. 2122.

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220112A00011	1/12/2022	0.79	1/12/2023	1/12/2022	100.02024	99.98418603	99.94817848	99.91221423	99.8762932	99.84041531	99.80458047	99.7687886	99.73303963
220125A00012	1/25/2022	0.92	1/20/2023	1/25/2022	100.04027	99.98203945	99.9238892	99.86582175	99.80783691	99.74993451	99.69211437	99.63437631	99.57672016
220317A00002	3/17/2022	1.49	1/17/2023	3/17/2022	100.06301	100.013072	99.9631973	99.91338949	99.86364841	99.81397394	99.76436592	99.71482423	99.66534873
220322A00009	3/22/2022	1.87	3/22/2023	3/22/2022	100.23971	100.0131211	99.78756566	99.56303441	99.33952032	99.11701649	98.89551605	98.67501221	98.45549823
220324A00006	3/24/2022	1.9	3/20/2023	3/24/2022	100.24281	100.0217133	99.80160067	99.58246558	99.36430149	99.14710193	98.93086047	98.71557076	98.50122649
220419A00010	4/19/2022	2.01	2/17/2023	4/19/2022	100.19871	100.062966	99.92759888	99.79260981	99.65799716	99.52375932	99.38989472	99.25640178	99.12327893
220425A00007	4/25/2022	2.34	4/25/2023	4/25/2022	100.46659	100.1462956	99.82804347	99.51181473	99.19759011	98.88535059	98.5750774	98.26675201	97.96035612
220428A00013	4/28/2022	2.04	2/1/2023	4/28/2022	100.1614	100.0698348	99.97844411	99.88722289	99.79617066	99.70528693	99.61457124	99.52402312	99.43364211
220510A00013	5/10/2022	2.03	1/10/2023	5/10/2022	100.055	100.0244665	99.99396316	99.96349479	99.93306135	99.90266278	99.87229902	99.84196999	99.81167563
220511A00001	5/11/2022	2.38	5/8/2023	5/11/2022	100.53057	100.1745141	99.82098439	99.46995286	99.12139306	98.7752789	98.43158465	98.09028492	97.75135472
220518A00016	5/18/2022	2.15	2/17/2023	5/18/2022	100.21776	100.0819883	99.94659896	99.81158767	99.67695284	99.54269288	99.40880622	99.27529126	99.14214644
220518A00017	5/18/2022	2.47	5/18/2023	5/18/2022	100.602	100.2184368	99.83780438	99.46006831	99.08519549	98.71315335	98.34390985	97.97743342	97.61369295
220524A00011	5/24/2022	2.14	2/24/2023	5/24/2022	100.23454	100.0794798	99.92489982	99.77080086	99.61718072	99.46403716	99.311368	99.15917104	99.0074441
220531A00022	5/31/2022	2.12	2/28/2023	5/31/2022	100.24224	100.0761626	99.91063035	99.74564127	99.58119275	99.41728217	99.25390694	99.09106449	98.92875224
220601A00021	6/1/2022	2.48	6/1/2023	6/1/2022	100.66048	100.2385441	99.82013644	99.40521403	98.99373348	98.58565213	98.18092802	97.77951987	97.3813871
220601A00027	6/1/2022	2.16	3/1/2023	6/1/2022	100.25148	100.082639	99.91436145	99.74664746	99.57949422	99.41289895	99.24685889	99.08137129	98.91643343
220602A00050	6/2/2022	2.41	6/2/2023	6/2/2022	100.71028	100.2846029	99.86252635	99.44400051	99.02898071	98.61742298	98.20928408	97.80452151	97.40309345
220608A00010	6/8/2022	2.33	3/8/2023	6/8/2022	100.30163	100.1134468	99.92597734	99.73921805	99.55316488	99.36781378	99.18316077	98.99920186	98.81593312
220614A00010	6/14/2022	3.46	6/14/2023	6/14/2022	101.15361	100.6949652	100.240489	99.7901231	99.34381181	98.9015004	98.46313513	98.02866322	97.59803285
220616A00037	6/16/2022	3.24	4/14/2023	6/16/2022	100.68656	100.3960293	100.1071885	99.8200201	99.53450943	99.2506421	98.96840388	98.68778069	98.40875862
220617A00045	6/17/2022	3.13	3/17/2023	6/17/2022	100.50004	100.2868013	100.0744742	99.86305705	99.65254403	99.44292926	99.23420696	99.0263714	98.81941688
220621A00021	6/21/2022	3.31	6/21/2023	6/21/2022	101.1257	100.6480497	100.1749122	99.7062271	99.24193156	98.78196406	98.32626418	97.87477264	97.42743125
220624A00026	6/24/2022	2.81	1/17/2023	6/24/2022	100.129	100.0790023	100.029071	99.9792066	99.92940905	99.87967819	99.83001386	99.78041592	99.73088425
220624A00027	6/24/2022	2.96	2/15/2023	6/24/2022	100.31818	100.1878008	100.0577778	99.92810502	99.79878109	99.66980454	99.54117395	99.41288791	99.28494501
220624A00028	6/24/2022	3.05	3/15/2023	6/24/2022	100.47285	100.2651546	100.0583268	99.85236354	99.64725948	99.44300915	99.23960717	99.03704824	98.83532705
220624A00029	6/24/2022	3.13	4/17/2023	6/24/2022	100.67171	100.3729776	100.0760259	99.78084088	99.48740665	99.19570763	98.9057284	98.61745369	98.33086845
220701A00031	7/1/2022	2.87	2/1/2023	7/1/2022	100.23746	100.1458296	100.0543698	99.96307954	99.8719584	99.78100589	99.69022154	99.59960488	99.50915546
220701A00032	7/1/2022	2.95	3/1/2023	7/1/2022	100.38525	100.2162352	100.0477888	99.87990645	99.71258527	99.54582253	99.37961544	99.21396128	99.04885731
220701A00034	7/1/2022	3.04	3/31/2023	7/1/2022	100.55158	100.2997575	100.0491946	99.79987933	99.55180254	99.304955	99.05932762	98.81491143	98.57169752
220715A00023	7/15/2022	3.36	3/31/2023	7/15/2022	100.63237	100.3804146	100.1297168	99.88026721	99.63205657	99.38507568	99.13931548	98.89476697	98.65142124
220720A00031	7/20/2022	3.4	3/20/2023	7/20/2022	100.57579	100.3541798	100.1335512	99.91390191	99.69522542	99.47751522	99.26076488	99.04496803	98.83011836
220721A00010	7/21/2022	3.42	4/21/2023	7/21/2022	100.7878	100.4778272	100.1697681	99.86360524	99.55932102	99.25689818	98.95631963	98.65756847	98.36062804
220725A00012	7/25/2022	3.34	3/24/2023	7/25/2022	100.58589	100.3532551	100.1217024	99.89122298	99.66180949	99.4334545	99.2061507	98.97989085	98.75466774

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12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220726A00056	7/26/2022	3.37	4/26/2023	7/26/2022	100.80438	100.4806577	100.1590125	99.83942685	99.52188103	99.20635556	98.8928312	98.58128898	98.27171013
220726A00058	7/26/2022	3.38	7/26/2023	7/26/2022	101.34652	100.7732059	100.2063784	99.64592441	99.0917367	98.54371065	98.00174386	97.46573623	96.93558983
220728A00069	7/28/2022	3.25	7/24/2023	7/28/2022	101.26176	100.6941412	100.1328857	99.57788539	99.02903603	98.48623571	97.94938479	97.41838576	96.89314329
220811A00002	8/11/2022	3.5	8/11/2023	8/11/2022	101.50098	100.8838957	100.2743216	99.67212057	99.07715924	98.48930742	97.90843803	97.33442699	96.76715318
220815A00005	8/15/2022	3.52	8/15/2023	8/15/2022	101.54079	100.9126943	100.2923736	99.67968714	99.07449448	98.47665849	97.8860454	97.30252468	96.7259689
220823A00025	8/23/2022	3.44	2/24/2023	8/23/2022	100.43663	100.2813155	100.1264856	99.97213741	99.81826865	99.66487714	99.51196067	99.35951705	99.20754409
220826A00030	8/26/2022	3.49	3/27/2023	8/26/2022	100.63966	100.3986896	100.1588738	99.92020366	99.68267107	99.44626789	99.21098611	98.9768178	98.74375506
220831A00035	8/31/2022	3.65	3/31/2023	8/31/2022	100.70559	100.4535101	100.2026901	99.95311873	99.70478678	99.45768505	99.21180448	98.96713605	98.72367086
220831A00084	8/31/2022	3.84	8/30/2023	8/31/2022	101.83583	101.1661896	100.5053559	99.85315282	99.20941208	98.5739698	97.9466663	97.32734596	96.71585711
220901A00003	9/1/2022	3.74	6/1/2023	9/1/2022	101.19486	100.7715732	100.3518221	99.9355644	99.52275669	99.11335623	98.70732098	98.30460958	97.90518136
220908A00027	9/8/2022	3.87	7/10/2023	9/8/2022	101.5224	100.9919386	100.467024	99.94757312	99.43350078	98.92472363	98.42116002	97.92272997	97.42935513
220912A00017	9/12/2022	3.89	6/12/2023	9/12/2022	101.33648	100.8827971	100.4331905	99.98760072	99.54597402	99.10825754	98.67439936	98.2443485	97.81805485
220914A00019	9/14/2022	4.25	8/14/2023	9/14/2022	101.98801	101.3610979	100.7419127	100.130309	99.52614776	98.92929351	98.339614	97.75698015	97.18126599
220914A00052	9/14/2022	4.29	9/11/2023	9/14/2022	102.23035	101.5268159	100.832987	100.1486629	99.47364893	98.80775559	98.15079864	97.50259874	96.86298131
220921A00020	9/21/2022	4.38	6/21/2023	9/21/2022	101.63865	101.1595479	100.6849767	100.2148677	99.74915798	99.28778586	98.83069083	98.37781351	97.92909559
220921A00021	9/21/2022	4.47	9/21/2023	9/21/2022	102.43889	101.7075579	100.9866888	100.2760637	99.57546502	98.88468127	98.20350692	97.53174212	96.86919256
220921A00025	9/21/2022	4.47	9/21/2023	9/21/2022	102.43889	101.7075579	100.9866888	100.2760637	99.57546502	98.88468127	98.20350692	97.53174212	96.86919256
220921A00045	9/21/2022	4.47	9/21/2023	9/21/2022	102.43889	101.7075579	100.9866888	100.2760637	99.57546502	98.88468127	98.20350692	97.53174212	96.86919256
220921A00093	9/21/2022	4.44	9/21/2023	9/21/2022	102.55491	101.821298	101.0982131	100.3854265	99.68271897	98.98987738	98.30669463	97.63296939	96.96850588
220923A00017	9/23/2022	4.41	5/23/2023	9/23/2022	101.3961	100.9969532	100.6009584	100.2080749	99.81826587	99.4314954	99.04772797	98.66692864	98.28906302
220923A00019	9/23/2022	4.46	6/23/2023	9/23/2022	101.69029	101.2056383	100.7256164	100.2501556	99.77919112	99.31265923	98.85049749	98.39264462	97.93904047
220923A00020	9/23/2022	4.54	8/23/2023	9/23/2022	102.24968	101.5974045	100.9534699	100.3177153	99.68998529	99.07012846	98.45799712	97.85344728	97.25633853
220926A00030	9/26/2022	4.4	4/26/2023	9/26/2022	101.1386	100.8141959	100.4918708	100.1716085	99.8533892	99.53719352	99.22300215	98.91079607	98.60055652
220926A00031	9/26/2022	4.44	5/26/2023	9/26/2022	101.4362	101.0287376	100.6245505	100.2235994	99.82584566	99.43125111	99.03977821	98.65138999	98.2660501
220926A00032	9/26/2022	4.49	6/26/2023	9/26/2022	101.73216	101.2391953	100.7510164	100.2675493	99.78872599	99.31447987	98.84474544	98.37945852	97.9185561
220926A00033	9/26/2022	4.53	7/26/2023	9/26/2022	102.00894	101.4334603	100.8644764	100.3018834	99.74557391	99.19544298	98.65138803	98.11330874	97.58110695
220926A00034	9/26/2022	4.58	8/28/2023	9/26/2022	102.31703	101.6509913	100.9936349	100.3447921	99.7042984	99.07199318	98.44772005	97.83132657	97.22266415
220926A00036	9/26/2022	4.68	9/26/2023	9/26/2022	102.63652	101.8908945	101.1561287	100.4319855	99.71823542	99.01465564	98.32102965	97.63714703	96.96280328
220927A00037	9/27/2022	4.32	3/31/2023	9/27/2022	100.87475	100.622386	100.3712836	100.1214309	99.87281864	99.62543774	99.37927905	99.13433357	98.89059239
220927A00066	9/27/2022	4.57	7/27/2023	9/27/2022	102.04057	101.4622629	100.8905197	100.3252266	99.76627464	99.21355767	98.66697166	98.12641498	97.59178818
220928A00054	9/28/2022	4.66	9/28/2023	9/28/2022	102.63894	101.8879139	101.1479018	100.4186614	99.69995861	98.99156604	98.29326276	97.60483412	96.92607156
220929A00026	9/29/2022	4.43	6/29/2023	9/29/2022	101.72939	101.2282478	100.7320441	100.2407033	99.75415425	99.27232717	98.79515358	98.32256632	97.85449953
221003A00030	10/3/2022	4.33	4/12/2023	10/3/2022	100.98591	100.7003146	100.4163459	100.1339896	99.85323204	99.57405954	99.29645862	99.02041597	98.74591841

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221004A00029	10/4/2022	4.54	9/28/2023	10/4/2022	102.54865	101.7979998	101.0583582	100.3294846	99.61114483	98.90311155	98.20516393	97.51708738	96.83867339
221004A00030	10/4/2022	4.51	8/28/2023	10/4/2022	102.27034	101.6044725	100.9472885	100.2986166	99.65829216	99.02615466	98.40204774	97.78581898	97.17731978
221004A00031	10/4/2022	4.48	7/28/2023	10/4/2022	101.99681	101.4159345	100.841679	100.2739309	99.71257993	99.15751842	98.60864106	98.0658449	97.52902924
221004A00032	10/4/2022	4.44	6/28/2023	10/4/2022	101.72543	101.2270344	100.7335185	100.2448149	99.76085358	99.28156568	98.80688378	98.33674171	97.87107458
221004A00033	10/4/2022	4.4	5/30/2023	10/4/2022	101.45696	101.0384869	100.6234626	100.2118425	99.80358487	99.39864878	98.99699383	98.59858033	98.20336921
221004A00034	10/4/2022	4.35	4/28/2023	10/4/2022	101.14065	100.8107497	100.4829956	100.1573706	99.83385426	99.512426	99.19306574	98.87575359	98.56046993
221011A00017	10/11/2022	4.44	5/11/2023	10/11/2022	101.29194	100.9259959	100.56271	100.2020484	99.84398253	99.48848449	99.13552658	98.78508155	98.43712255
221012A00047	10/12/2022	4.71	10/12/2023	10/12/2022	102.79699	102.0076211	101.2304103	100.4650817	99.71136386	98.96899341	98.23771504	97.51728102	96.80745093
221014A00006	10/14/2022	4.71	7/14/2023	10/14/2022	102.00502	101.4621825	100.9251341	100.3937864	99.86804856	99.34783202	98.83304991	98.32361717	97.81945056
221018A00023	10/18/2022	4.89	10/18/2023	10/18/2022	103.0055	102.1989285	101.4050339	100.6235197	99.85409734	99.09648717	98.35041817	97.61562752	96.89186035
221019A00032	10/19/2022	4.66	5/15/2023	10/19/2022	101.41228	101.0350841	100.6607065	100.289114	99.92027556	99.55416046	99.19073853	98.82998002	98.47185563
221020A00038	10/20/2022	4.95	8/21/2023	10/20/2022	102.49899	101.8512133	101.211653	100.5801492	99.95654992	99.34070722	98.73247674	98.13171769	97.53829276
221021A00012	10/21/2022	4.92	7/21/2023	10/21/2022	102.18586	101.6233901	101.067131	100.5169774	99.97282882	99.43458731	98.90215682	98.37544345	97.8543553
221021A00013	10/21/2022	5.01	9/21/2023	10/21/2022	102.83479	102.101841	101.3793809	100.6671809	99.96502303	99.27269564	98.58999292	97.91671477	97.25266662
221021A00020	10/21/2022	4.92	7/21/2023	10/21/2022	102.18586	101.6233901	101.067131	100.5169774	99.97282882	99.43458731	98.90215682	98.37544345	97.8543553
221024A00009	10/24/2022	4.98	10/19/2023	10/24/2022	103.08813	102.278498	101.4816287	100.6972251	99.92499581	99.16465839	98.41593914	97.67857267	96.95230167
221024A00016	10/24/2022	4.8	5/24/2023	10/24/2022	101.56216	101.1598745	100.76078	100.3648403	99.97201807	99.58227656	99.19557958	98.8118915	98.43117727
221026A00018	10/26/2022	4.78	5/5/2023	10/26/2022	101.35465	101.0050562	100.6578766	100.3130872	99.97066328	99.63058064	99.29281525	98.95734345	98.62414189
221027A00003	10/27/2022	4.92	10/23/2023	10/27/2022	103.07057	102.2503369	101.4432057	100.6488627	99.86700529	99.09734026	98.33958352	97.59345975	96.8587021
221027A00045	10/27/2022	4.83	6/27/2023	10/27/2022	101.90989	101.4136847	100.9223178	100.4357166	99.95381194	99.47653611	99.00382259	98.53560618	98.07182288
221028A00038	10/28/2022	4.8	5/3/2023	10/28/2022	101.34095	100.9968885	100.6551593	100.315743	99.97861615	99.64375569	99.31113879	98.98074297	98.65254602
221028A00039	10/28/2022	4.88	8/2/2023	10/28/2022	102.27542	101.6800362	101.0915971	100.5099796	99.93506546	99.36673928	98.80488813	98.24940172	97.70017224
221028A00041	10/28/2022	4.94	10/25/2023	10/28/2022	103.10665	102.2808646	101.4683547	100.6687988	99.88188857	99.1073252	98.3448193	97.59409046	96.8548669
221031A00014	10/31/2022	4.9	6/30/2023	10/31/2022	101.97532	101.4707351	100.9711407	100.4764649	99.9866356	99.5015817	99.02123371	98.54552343	98.07438396
221102A00034	11/2/2022	4.99	8/2/2023	11/2/2022	102.34091	101.7453022	101.1566439	100.574809	99.99967932	99.43113933	98.86907612	98.31337938	97.76394128
221103A00038	11/3/2022	4.92	6/2/2023	11/3/2022	101.70141	101.2741471	100.8504752	100.4303504	100.0137283	99.60056515	99.19081803	98.78444467	98.38140351
221103A00039	11/3/2022	4.99	7/3/2023	11/3/2022	102.04992	101.5369199	101.0290878	100.5263413	100.0286041	99.53580168	99.04786077	98.56470968	98.08627808
221116A00024	11/16/2022	4.99	11/16/2023	11/16/2022	103.37114	102.4848288	101.6137837	100.7576114	99.91593245	99.08838039	98.27460089	97.47425142	96.68700076
221118A00006	11/18/2022	4.92	5/30/2023	11/18/2022	101.67462	101.2556068	100.8400424	100.4278854	100.0190942	99.61362764	99.21144541	98.81250775	98.41677557
221118A00009	11/18/2022	5.05	8/30/2023	11/18/2022	102.64962	101.9769273	101.3130694	100.6578703	100.0111613	99.37277802	98.74256041	98.12035244	97.50600202
221118A00051	11/18/2022	5.01	7/31/2023	11/18/2022	102.33402	101.7438704	101.1605397	100.583906	100.0138542	99.45027225	98.89305032	98.34208118	97.79725996
221122A00010	11/22/2022	5.16	11/22/2023	11/22/2022	103.58593	102.6824246	101.7947516	100.9224992	100.0652673	99.22266944	98.39433245	97.57989572	96.77901075
221123A00027	11/23/2022	5.15	8/23/2023	11/23/2022	102.64816	101.9944294	101.3490472	100.7118582	100.0827067	99.46144105	98.84791348	98.24197979	97.64349935

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221128A00048	11/28/2022	5.08	6/28/2023	11/28/2022	102.04461	101.5452899	101.0508554	100.5612397	100.0763726	99.59618535	99.12061036	98.6495814	98.18303351
221129A00022	11/29/2022	5.16	11/29/2023	11/29/2022	103.66059	102.737879	101.8316631	100.9415024	100.0669724	99.20766347	98.36318007	97.53314032	96.71717539
221129A00030	11/29/2022	5.1	7/27/2023	11/29/2022	102.34732	101.7680087	101.1952633	100.6289761	100.0690381	99.51534297	98.9677866	98.42626724	97.89068537
221129A00031	11/29/2022	5.13	8/23/2023	11/29/2022	102.6351	101.9814122	101.3360775	100.6989355	100.0698305	99.44861112	98.83512934	98.22924102	97.63080555
221130A00011	11/30/2022	5.19	11/27/2023	11/30/2022	103.66678	102.7494162	101.8483609	100.9631806	100.0934577	99.23878916	98.3987859	97.57307212	96.76128479
221230A00107	12/30/2022	5.12	10/2/2023	12/30/2022	103.02563	102.262187	101.5100956	100.7691006	100.0389574	99.31942859	98.6102837	97.91129882	97.22225645
221228A00041	12/28/2022	5.08	7/28/2023	12/28/2022	102.34574	101.7637087	101.1883091	100.6194262	100.0569497	99.50077164	98.95078671	98.40689179	97.86898608
221230A00103	12/30/2022	5.15	12/26/2023	12/30/2022	103.95289	102.9558583	101.9780518	101.0189126	100.0779089	99.15452884	98.24827974	97.35868709	96.48529382
221230A00030	12/30/2022	5.15	12/26/2023	12/30/2022	103.95289	102.9558583	101.9780518	101.0189126	100.0779089	99.15452884	98.24827974	97.35868709	96.48529382
221230A00033	12/30/2022	5.11	8/30/2023	12/30/2022	102.68997	102.0171291	101.3531213	100.6977737	100.0509174	99.41238835	98.78202624	98.15967507	97.54518276
221223A00012	12/23/2022	4.99	7/24/2023	12/23/2022	102.25443	101.6835834	101.1191203	100.5609381	100.0089321	99.46300018	98.92304231	98.38896069	97.86065962
221208A00095	12/8/2022	5.12	10/13/2023	12/8/2022	103.13158	102.3380494	101.5567838	100.7874967	100.0299133	99.2837676	98.54880135	97.8247641	97.11141286
221205A00055	12/5/2022	5.1	9/5/2023	12/5/2022	102.74256	102.053257	101.3732318	100.7022974	100.0402722	99.3869792	98.7422462	98.10590545	97.47779358
221219A00004	12/19/2022	4.99	7/19/2023	12/19/2022	102.20573	101.6486449	101.0976478	100.5526415	100.0135285	99.48021346	98.9526029	98.43060549	97.91413181
221213A00021	12/13/2022	4.97	6/14/2023	12/13/2022	101.84826	101.3877277	100.9313728	100.4791406	100.0309753	99.58682189	99.14662666	98.71033665	98.27789989
221228A00038	12/28/2022	5.11	12/28/2023	12/28/2022	103.93446	102.9321587	101.9492819	100.9852667	100.0395729	99.11168102	98.20109083	97.30732082	96.42990722
221220A00001	12/20/2022	5.03	8/21/2023	12/20/2022	102.55081	101.9028439	101.2630967	100.6314076	100.0076247	99.39160004	98.78318918	98.18225135	97.58864919
150601A00342	6/1/2015	3.97	8/26/2033	6/1/2015	117.04583	111.4648408	106.2730449	101.4383535	96.93162086	92.72635461	88.79845371	85.12597406	81.68891868
150601A00439	6/1/2015	2.57	3/18/2024	6/1/2015	100.87718	100.2682869	99.66938414	99.08019938	98.50046978	97.92994247	97.36837408	96.81553028	96.27118536
150601A00440	6/1/2015	3.27	3/16/2029	6/1/2015	108.2522	105.0912939	102.070383	99.18193717	96.41889033	93.77460776	91.24285681	88.81777982	86.49386893
150601A00450	6/1/2015	3.28	4/27/2029	6/1/2015	108.43001	105.209901	102.1345733	99.19613391	96.38717991	93.70076602	91.13037316	88.66987933	86.31353272
150601A00460	6/1/2015	3.05	5/16/2029	6/1/2015	107.76927	104.5393288	101.4556789	98.51029654	95.69565653	93.00470143	90.4308093	87.96776381	85.60972661
150601A00506	6/1/2015	3.14	7/6/2029	6/1/2015	108.22779	104.9169988	101.7589877	98.74522344	95.86771969	93.11899434	90.4920343	87.98026285	85.57750946
150601A00528	6/1/2015	3.08	7/27/2029	6/1/2015	108.09762	104.7633423	101.5840372	98.55099447	95.65606308	92.89160992	90.25048314	87.72597858	85.3118086
150601A00559	6/1/2015	3.06	8/31/2029	6/1/2015	108.14412	104.7614331	101.5379325	98.46457386	95.53289392	92.73497287	90.06339556	87.51121591	85.07192395
150601A00684	6/1/2015	2.25	2/7/2025	6/1/2015	101.28358	100.2364319	99.21021613	98.2043322	97.21820161	96.25126749	95.30299364	94.3728635	93.4603793
160603A00015	6/3/2016	1.95	6/5/2023	6/3/2016	100.44082	100.0122571	99.58737275	99.16611729	98.74844432	98.33430818	97.923664	97.51646765	97.11267575
160608A00026	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5478708	99.50753555	96.57853667	93.75617278	91.03596721	88.41365597	85.88517642	83.44665662
160608A00031	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5478708	99.50753556	96.57853663	93.7561727	91.0359671	88.41365583	85.88517623	83.44665641
160608A00032	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5478708	99.50753555	96.57853665	93.75617275	91.03596717	88.41365592	85.88517635	83.44665654
160609A00075	6/9/2016	1.94	6/9/2026	6/9/2016	102.06548	100.3190124	98.62158337	96.97141631	95.36681523	93.80615773	92.28789121	90.81052933	89.37264877
160628A00006	6/28/2016	1.44	6/28/2023	6/28/2016	100.14213	99.89118041	99.64201449	99.39461589	99.1489637	98.90503739	98.66281674	98.42228188	98.18341327
161222A00035	12/22/2016	2.29	12/22/2023	12/22/2016	100.61252	100.1139802	99.62220851	99.13705579	98.65837353	98.18601792	97.71984965	97.25973372	96.80553927

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
161222A00036	12/22/2016	2.69	12/22/2026	12/22/2016	103.96863	101.9732462	100.0396334	98.16537053	96.34814639	94.58575695	92.87609953	91.21716744	89.60704494
161222A00037	12/22/2016	3.08	12/22/2031	12/22/2016	110.93812	106.3575269	102.0548679	98.01010816	94.2048314	90.622096	87.24630618	84.06309528	81.05921984
170406A00031	4/6/2017	3.01	4/6/2027	4/6/2017	109.99516	106.0430477	102.2642505	98.65011748	95.19248563	91.8836452	88.71631187	85.68360058	82.77900124
170921A00056	9/21/2017	2.82	9/21/2027	9/21/2017	110.252	105.920498	101.7958861	97.8670119	94.12339243	90.55516824	87.15306266	83.90834379	80.81278923
180321A00015	3/21/2018	3.02	3/21/2025	3/21/2018	102.81676	101.4852047	100.1834239	98.91050278	97.66556033	96.4477502	95.25625911	94.09030526	92.94913679
180322A00030	3/22/2018	2.79	3/24/2025	3/22/2018	102.28977	101.1598046	100.0532722	98.96947895	97.90776212	96.86748407	95.84803132	94.84881333	93.86926143
180329A00011	3/29/2018	2.77	3/29/2023	3/29/2018	100.26175	100.1355332	100.0097927	99.88452734	99.75973416	99.63541026	99.51155276	99.3881588	99.26522556
180508A00038	5/8/2018	3.57	5/9/2033	5/8/2018	115.83795	110.1037621	104.772953	99.81231008	95.1916512	90.88352541	86.86294571	83.10714956	79.59538417
201119A00023	11/23/2020	2.23	11/21/2030	11/23/2020	111.8085	103.9977485	96.7939675	90.1467868	84.01025965	78.34245105	73.10506901	68.26313145	63.78466498
220315A00037	3/17/2022	2.63	3/16/2027	3/17/2022	109.26851	105.0333625	100.9871885	97.12050123	93.42434956	89.89028105	86.51031126	83.27689481	80.18289863
221212A00063	12/12/2022	4.45	12/12/2025	12/12/2022	111.28295	108.2645323	105.3453872	102.5217004	99.78982829	97.14628727	94.58774551	92.11101563	89.7130475
200318A00054	3/18/2020	1.56	3/18/2025	3/18/2020	101.72075	99.54896146	97.4338514	95.37352759	93.3661804	91.41007536	89.50354934	87.64500692	85.83291703
200327A00054	3/27/2020	0.9	3/27/2023	3/27/2020	100.01445	99.77450103	99.53570019	99.29804129	99.06151618	98.82611678	98.5918351	98.35866322	98.12659329
220915A00041	9/15/2022	4.28	5/15/2024	9/15/2022	104.41355	103.0379043	101.6870537	100.3603851	99.05730434	97.77723601	96.51962313	95.28392626	94.06962284
221108A00036	11/8/2022	4.95	11/7/2025	11/8/2022	112.30505	109.3671643	106.5229077	103.7687967	101.1014945	98.51780633	96.0146723	93.58916095	91.2384632
210706A00014	7/6/2021	1.15	6/26/2026	7/6/2021	102.14785	98.74923364	95.48117603	92.33797687	89.31421897	86.40474962	83.60466617	80.9093025	78.31421626
200325A00044	3/25/2020	1.7	12/23/2024	3/25/2020	101.66598	99.72323965	97.82731366	95.97678739	94.17029794	92.40653264	90.68422682	89.00216172	87.35916247
200327A00068	6/25/2020	0.93	6/26/2023	6/25/2020	99.976393	99.48848091	99.00531456	98.52682496	98.0529445	97.58360687	97.11874703	96.65830117	96.20220669
200421A00020	4/24/2020	0.83	3/15/2024	4/24/2020	99.589991	98.40661991	97.25114452	96.12258881	95.02002148	93.94255373	92.88933689	91.85956013	90.85244841
220512A00007	5/12/2022	2.91	5/13/2024	5/12/2022	102.51932	101.1625633	99.83019713	98.52161545	97.23623618	95.97349582	94.73284869	93.51376622	92.31573629
220727A00001	7/27/2022	3.39	7/27/2023	7/27/2022	101.3576	100.7815458	100.2120339	99.648954	99.09219749	98.54165832	97.99723275	97.45881937	96.92631896
200611A00021	6/11/2020	0.72	6/11/2024	6/11/2020	99.504536	98.093484	96.70915774	95.35086576	94.01793955	92.70973298	91.42562137	90.16500063	88.92728641
210201A00001	2/1/2021	0.77	12/16/2025	2/1/2021	100.41544	97.54799455	94.77651438	92.09727728	89.50672785	87.00146777	84.57824787	82.23396078	79.96563387
211227A00005	12/27/2021	1.61	12/18/2026	12/27/2021	104.56418	100.6626704	96.92789399	93.35187335	89.92705038	86.64626622	83.50273805	80.49003731	77.60206936
221219A00043	12/19/2022	4.07	12/17/2027	12/19/2022	118.13934	112.9528255	108.0310672	103.3591151	98.92293768	94.7093638	90.70602565	86.90130564	83.2842871
200327A00045	3/27/2020	2.24	3/27/2034	3/27/2020	116.96425	105.766613	95.75949868	86.80932835	78.79817606	71.62185837	65.18826885	59.41592199	54.23267925
210121A00018	1/25/2021	0.5	8/25/2023	1/25/2021	99.604517	98.95659937	98.31706727	97.68575894	97.06251666	96.44718669	95.83961922	95.23966817	94.64719111
220525A00020	5/25/2022	2.79	5/24/2024	5/25/2022	102.4231	101.037267	99.67682542	98.34114152	97.02959819	95.74159833	94.47656408	93.23393608	92.01317271
221129A00044	11/29/2022	4.56	11/28/2025	11/29/2022	111.43886	108.4568238	105.5716292	102.7796061	100.077243	97.46118061	94.92820401	92.47523582	90.09932948
221027A00060	12/1/2022	4.46	12/1/2027	12/1/2022	119.95682	114.769222	109.8436433	105.165422	100.7207963	96.49684066	92.48141039	88.66309077	85.03114945
220909A00017	9/9/2022	3.85	9/9/2024	9/9/2022	104.9078	103.2142337	101.5561928	99.93261819	98.34249727	96.78485734	95.25876351	93.76331688	92.29765276
210929A00012	3/16/2022	1.03	3/14/2025	3/16/2022	100.53354	98.38581451	96.2939951	94.25622231	92.2707176	90.33577594	88.44976209	86.61110708	84.8183049
220601A00023	6/1/2022	2.9	6/3/2024	6/1/2022	102.62904	101.2152033	99.82773052	98.46594595	97.12919845	95.81685839	94.5283168	93.26298452	92.0202914

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200331A00018	3/31/2020	0.82	3/31/2023	3/31/2020	99.991079	99.74019849	99.49057142	99.24218841	98.99504023	98.74911774	98.50441187	98.26091366	98.01861422
201216A00004	12/16/2020	0.74	9/8/2025	12/16/2020	100.16803	97.56097842	95.03405293	92.58428318	90.20883449	87.90499687	85.67017849	83.50189964	81.39778693
221027A00046	10/27/2022	4.92	10/27/2023	10/27/2022	103.10966	102.2784779	101.4607385	100.6561179	99.8643017	99.08498575	98.31787527	97.56268476	96.81913754
200826A00036	8/28/2020	0.88	7/28/2023	8/28/2020	99.903244	99.32928966	98.7618986	98.20095902	97.6463615	97.09799908	96.55576718	96.01956356	95.48928823
210407A00013	4/7/2021	1.23	4/7/2026	4/7/2021	102.15636	98.96530658	95.88972146	92.92476266	90.06582658	87.30853041	84.64870002	82.08235855	79.60571573
210914A00011	9/16/2021	0.52	9/18/2023	9/16/2021	99.551195	98.83955935	98.13804725	97.44644355	96.76453952	96.09213223	95.42902437	94.7750241	94.1299448
210928A00008	9/28/2021	1.35	9/28/2026	9/28/2021	103.21671	99.55404064	96.04007075	92.66791823	89.4310659	86.32333689	83.33887443	80.47212314	77.71781145
220325A00019	3/28/2022	2.86	3/23/2027	3/28/2022	110.29173	106.016028	101.9315945	98.02879846	94.29855194	90.73227544	87.32186632	84.05966924	80.93844871
221215A00115	12/15/2022	4	12/15/2027	12/15/2022	117.77362	112.6016425	107.6935315	103.0343925	98.61025212	94.40799318	90.4152977	86.62059421	83.01300876
200415A00003	4/15/2020	0.77	4/14/2023	4/15/2020	99.967175	99.67801178	99.39052972	99.10471401	98.82055012	98.53802369	98.25712051	97.97782657	97.700128
200427A00018	4/27/2020	1.51	4/27/2028	4/27/2020	105.70091	100.475718	95.5388437	90.87295313	86.46184105	82.29034938	78.34429455	74.61040014	71.07623452
200916A00023	9/16/2020	0.42	9/16/2024	9/16/2020	99.422648	97.7529817	96.11886436	94.51922673	92.95304233	91.41932567	89.9171302	88.44554631	87.00369953
220518A00009	5/18/2022	3.38	5/18/2028	5/18/2022	115.77349	110.2265762	104.9845472	100.0290327	95.34286142	90.90997652	86.71535765	82.74494911	78.98559319
200310A00040	3/10/2020	1.36	3/10/2028	3/10/2020	104.85416	99.77462186	94.96951262	90.42257965	86.11862278	82.04341775	78.18364804	74.52684193	71.06131429
200320A00013	3/20/2020	1.25	3/20/2024	3/20/2020	100.33362	99.12884896	97.95281189	96.80449075	95.68291548	94.5871608	93.51634369	92.46962095	91.44618701
200708A00011	7/10/2020	2.87	7/10/2031	7/10/2020	117.94092	109.2977042	101.3682673	94.08959865	87.40456134	81.26131934	75.61282058	70.41633289	65.63302706
210611A00006	6/11/2021	1.85	6/11/2031	6/11/2021	109.29441	101.077982	93.54268191	86.62849766	80.28098661	74.45073541	69.09287251	64.16663	59.63494975
211206A00008	12/6/2021	1.24	12/6/2024	12/6/2021	100.70244	98.81471501	96.97148679	95.17144272	93.4133158	91.69588458	90.01797119	88.37843948	86.77619327
220722A00049	9/15/2022	3.25	9/15/2025	9/15/2022	106.99354	104.2750962	101.6399661	99.08505414	96.60740707	94.20420217	91.8727404	89.61044	87.41483043
221215A00082	12/15/2022	4.27	12/15/2025	12/15/2022	110.78502	107.7657114	104.8460278	102.0221327	99.2903592	96.64720147	94.08930719	91.61346971	89.21662088
200305A00039	3/5/2020	1.58	3/5/2030	3/5/2020	106.39396	99.43166313	92.97032747	86.97135728	81.39932292	76.22168358	71.40853741	66.93239456	62.76797083
210729A00006	7/29/2021	1.87	11/30/2032	7/29/2021	110.33801	100.7751061	92.12512769	84.29600251	77.2053748	70.77953972	64.95249597	59.66510627	54.864353
211213A00011	12/13/2021	1.32	12/13/2024	12/13/2021	100.87934	98.97121667	97.1084933	95.2898193	93.51388975	91.77944713	90.08527927	88.43021737	86.81313416
220331A00010	3/31/2022	2.83	2/18/2026	3/31/2022	107.01292	103.8732609	100.8426571	97.9166864	95.09113254	92.36197594	89.7253833	87.1776976	84.71542886
220727A00009	7/27/2022	3.31	7/28/2025	7/27/2022	106.73798	104.1531441	101.6446061	99.20965007	96.84567704	94.55019711	92.32082419	90.15527087	88.05134366
221129A00048	11/29/2022	4.56	12/1/2025	11/29/2022	111.4747	108.4839711	105.5906176	102.7909348	100.0813832	97.45857733	94.91927759	92.46038332	90.07892605
221221A00043	12/21/2022	4.26	12/19/2025	12/21/2022	110.80059	107.7700006	104.8397591	102.0059903	99.26498748	96.613208	94.04726459	91.56391777	89.16006854
200324A00029	3/24/2020	1.86	3/24/2025	3/24/2020	102.41555	100.2197978	98.08163463	95.99913091	93.97043699	91.99378065	90.06746308	88.18985516	86.35939393
210309A00004	3/11/2021	0.87	11/25/2024	3/11/2021	99.983282	98.13113369	96.32204823	94.55477176	92.82809527	91.14085248	89.49191809	87.88020604	86.30466789
200220A00013	2/20/2020	2.09	12/14/2029	2/20/2020	109.83073	102.9567839	96.56152461	90.60915016	85.06670597	79.90384816	75.09262439	70.60727412	66.42404652
201201A00002	12/1/2020	0.54	12/1/2023	12/1/2020	99.393396	98.4866682	97.59635772	96.72202259	95.86323645	95.01958797	94.19068023	93.37613006	92.57556744
201210A00021	12/10/2020	0.89	12/10/2027	12/10/2020	103.46134	98.61745656	94.02591827	89.6723336	85.54320584	81.62587027	77.90843873	74.37974813	71.02931265
210211A00005	2/11/2021	0.45	6/15/2023	2/11/2021	99.766867	99.30928972	98.85590384	98.40665183	97.96147725	97.52032468	97.08313974	96.649869	96.22045997

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220317A00026	5/3/2022	2.59	5/3/2027	5/3/2022	109.43244	105.0654442	100.8986576	96.92188975	93.12551662	89.50044938	86.03810191	82.73036048	79.56955549
200818A00018	3/31/2021	0.57	4/1/2024	3/31/2021	99.26032	98.03489509	96.83873469	95.67079846	94.5300949	93.4156785	92.32664712	91.26213953	90.2213331
210208A00004	2/11/2021	0.76	10/15/2025	2/11/2021	100.28353	97.57886	94.95992434	92.42351442	89.96656109	87.58612902	85.27940991	83.04371611	80.87647462
210225A00006	2/25/2021	0.98	2/25/2026	2/25/2021	101.22473	98.15705454	95.19728463	92.34100096	89.58399641	86.92226186	84.35197547	81.86949261	79.47133643
210907A00010	9/7/2021	2.58	9/7/2040	9/7/2021	117.13036	101.0727907	87.52453354	76.07378385	66.37854511	58.15447353	51.16489298	45.21258136	40.13300722
220408A00014	4/8/2022	3.12	6/29/2026	4/8/2022	109.04715	105.5202569	102.127891	98.86419229	95.72359083	92.70078836	89.79074378	86.98865914	84.28996654
220712A00006	7/12/2022	3.36	7/12/2024	7/12/2022	103.59815	102.0732811	100.5785265	99.11306613	97.67610806	96.26688857	94.88467079	93.5287435	92.19842005
210420A00010	4/20/2021	1.08	12/12/2025	4/20/2021	101.32436	98.45391531	95.67907691	92.99615102	90.40160977	87.89208054	85.46433811	83.11529745	80.84200674
200415A00020	4/15/2020	0.86	4/15/2024	4/15/2020	99.653361	98.38991326	97.15264376	95.94074383	94.75343859	93.58998485	92.44966957	91.33180824	90.23574351
220601A00024	6/1/2022	3.09	6/2/2025	6/1/2022	105.72208	103.3006198	100.9472337	98.65963082	96.43560804	94.27304922	92.16992116	90.12426987	88.13421695
221121A00052	11/21/2022	4.35	11/22/2027	11/21/2022	119.32313	114.1756496	109.287177	104.6432834	100.2304171	96.03584606	92.04760451	88.25444262	84.64578026
221129A00073	11/29/2022	4.39	12/2/2026	11/29/2022	115.39567	111.3250936	107.4241697	103.6849211	100.099787	96.66159974	93.36356263	90.19922854	87.16248017
221129A00075	11/29/2022	4.38	12/1/2026	11/29/2022	115.34425	111.2774871	107.3801117	103.6441676	100.0621104	96.62678749	93.33141632	90.16956294	87.13512234
220727A00049	7/27/2022	3.31	7/25/2025	7/27/2022	106.71133	104.1350795	101.6347034	99.20751085	96.85092344	94.56247066	92.33978466	90.18059524	88.08272513
200316A00019	3/16/2020	1.11	3/16/2023	3/16/2020	100.06875	99.85891028	99.64995973	99.44189432	99.23470838	99.0283963	98.82295252	98.61837151	98.41464781
221130A00085	11/30/2022	4.19	11/30/2027	11/30/2022	118.61978	113.4674933	108.575745	103.9299525	99.51642733	95.32231271	91.33552866	87.5447212	83.93921511
200310A00033	3/10/2020	0.91	3/10/2025	3/10/2020	100.71559	98.56740984	96.47508173	94.43675237	92.45064826	90.51506898	88.62838354	86.78902686	84.99549654
200417A00008	4/17/2020	0.96	4/17/2025	4/17/2020	100.45029	98.21446397	96.03888696	93.92156868	91.86059716	89.85413639	87.90042277	85.99776165	84.14452414
200415A00037	4/15/2020	0.97	4/15/2025	4/15/2020	100.46937	98.23847887	96.06757965	93.95468284	91.89788091	89.89534268	87.94530964	86.04609246	84.19606776
200521A00016	5/21/2020	2.18	5/21/2037	5/21/2020	113.09078	99.70954996	88.09334277	77.99805044	69.21452325	61.56341196	54.89079014	49.06443785	43.970684
220314A00009	3/14/2022	2.38	7/28/2025	3/14/2022	104.33715	101.7836351	99.30570929	96.90067984	94.56596866	92.29910604	90.09772528	87.95955761	85.8824275
220812A00014	8/12/2022	3.54	8/12/2024	8/12/2022	104.13441	102.5216755	100.9417712	99.39376137	97.87674347	96.38984889	94.93224131	93.50311521	92.10169439
200311A00031	3/11/2020	1.41	12/24/2027	3/11/2020	104.96806	100.0860787	95.4587589	91.07153572	86.9107482	82.96358092	79.21800733	75.66273727	72.28716819
201015A00003	10/15/2020	0.75	10/15/2025	10/15/2020	100.25556	97.55128459	94.93273371	92.39669948	89.94011303	87.56003931	85.25367029	83.01831859	80.85141143
210324A00002	3/24/2021	2.06	3/24/2031	3/24/2021	110.83534	102.7510763	95.31987527	88.48548549	82.19678017	76.40726519	71.07463672	66.16038319	61.62942711
220526A00011	5/26/2022	3.29	5/24/2029	5/26/2022	117.14289	110.5579649	104.3943877	98.62292402	93.21651317	88.15009534	83.40045411	78.9460721	74.76699852
221110A00110	11/10/2022	4.47	1/13/2026	11/10/2022	111.72202	108.6091101	105.6011009	102.6938596	99.8834405	97.16607602	94.53816766	91.99627725	89.53711885
200324A00031	3/24/2020	1.64	3/22/2024	3/24/2020	100.58825	99.38009058	98.20079389	97.04933878	95.92474866	94.82609214	93.75248043	92.70306495	91.67703505
221216A00048	12/16/2022	4.32	7/16/2025	12/16/2022	109.20568	106.622004	104.1136903	101.6780926	99.31267179	97.01499396	94.7827253	92.61362728	90.50555213
221129A00032	11/29/2022	5.04	5/22/2024	11/29/2022	105.5515	104.1483932	102.7708801	101.4183175	100.0900845	98.7855806	97.50422471	96.24545414	95.0087241
220426A00004	4/26/2022	3.41	4/26/2032	4/26/2022	124.21426	114.5507917	105.7438027	97.71218535	90.38292224	83.69024128	77.57486279	71.98332826	66.86740159
220825A00006	8/25/2022	3.56	8/25/2027	8/25/2022	114.64568	109.8549442	105.2959496	100.9562078	96.82397001	92.88818221	89.13844006	85.56494705	82.1584755
201223A00013	12/23/2020	0.9	12/11/2026	12/23/2020	101.72908	97.90190193	94.23817416	90.73009206	87.3702663	84.15169639	81.06774812	78.11213252	75.27888602

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220224A00018	2/24/2022	2.15	3/16/2026	2/24/2022	105.03604	101.8564415	98.78964638	95.83097734	92.97598619	90.22043739	87.5602963	84.99171813	82.51103772
220420A00037	6/15/2022	3.3	6/15/2027	6/15/2022	112.88502	108.3263599	103.9810014	99.83783858	95.88639738	92.11680045	88.51973009	85.08639365	81.8084912
210304A00006	3/4/2021	1.02	3/4/2026	3/4/2021	101.37233	98.28348868	95.30381929	92.42882875	89.65423938	86.97597609	84.39015528	81.89307453	79.48120287
220114A00010	1/14/2022	1.86	1/13/2027	1/14/2022	105.6922	101.6997572	97.88028858	94.22539105	90.72711475	87.37793669	84.17073542	81.09876735	78.15564465
221129A00067	11/29/2022	4.28	11/29/2027	11/29/2022	119.05177	113.8917291	108.9923358	104.3390203	99.91809796	95.71671508	91.72279403	87.9249826	84.31260675
221130A00044	11/30/2022	5.09	5/30/2024	11/30/2022	105.72197	104.2956505	102.8957028	101.521457	100.1722654	98.84750173	97.54656005	96.26885406	95.01381631
200402A00044	4/2/2020	1.65	4/2/2030	4/2/2020	106.93139	99.87994416	93.34030055	87.27268736	81.64062176	76.41062122	71.55194171	67.03634016	62.83785868
200415A00027	4/15/2020	0.86	4/15/2024	4/15/2020	99.653361	98.38991326	97.15264376	95.94074383	94.75343859	93.58998485	92.44966957	91.33180824	90.23574351
200528A00021	5/28/2020	0.63	5/26/2023	5/28/2020	99.883565	99.47990972	99.07950726	98.6823186	98.28830522	97.89742916	97.50965311	97.12494031	96.74325461
210917A00003	9/17/2021	0.8	9/17/2024	9/17/2021	99.725384	98.05667559	96.42342923	94.82457852	93.25910051	91.72601302	90.22437262	88.7532727	87.31184159
220907A00023	9/7/2022	3.76	9/8/2026	9/7/2022	112.03578	108.2621456	104.6381031	101.1568546	97.81195703	94.59729761	91.50707496	88.53578107	85.67818455
221207A00009	12/7/2022	4.38	12/8/2025	12/7/2022	111.02958	108.0260039	105.1208887	102.3104661	99.59113421	96.95944878	94.41211514	91.94598089	89.55802887
200406A00053	4/6/2020	1.13	4/7/2025	4/6/2020	100.8177	98.6034382	96.44819187	94.34999057	92.30694233	90.31723295	88.37912212	86.4909397	84.65108232
220929A00043	9/29/2022	4.44	9/28/2029	9/29/2022	125.45435	118.2613433	111.5451822	105.2714425	99.40837469	93.92667864	88.79930169	84.00125426	79.50944168
221121A00047	11/21/2022	4.89	11/21/2033	11/21/2022	142.53146	130.4570641	119.5843563	109.7849483	100.9448772	92.96291747	85.74909534	79.22338255	73.31454812
221207A00012	12/7/2022	4.21	12/7/2026	12/7/2022	114.74817	110.6762635	106.7747727	103.0356554	99.45128921	96.01444976	92.71828788	89.55630802	86.52234817
200302A00056	3/2/2020	1.2	3/2/2023	3/2/2020	100.08885	99.91746277	99.74666043	99.57644154	99.40680312	99.23774224	99.06925595	98.90134136	98.73399556
200330A00037	3/30/2020	1.09	3/28/2025	3/30/2020	100.70296	98.51603913	96.38680474	94.31331678	92.29371322	90.3262104	88.40909896	86.54074005	84.71956176
201015A00024	10/19/2020	1.53	10/18/2027	10/19/2020	105.38265	100.6647307	96.18431109	91.92822907	87.88411861	84.04035888	80.38602538	76.91084452	73.60515144
210208A00006	2/9/2021	0.46	8/15/2023	2/9/2021	99.609325	98.98810574	98.37460402	97.76867663	97.17018392	96.57898964	95.99496089	95.41796794	94.84788421
220217A00011	2/17/2022	2.08	2/14/2025	2/17/2022	102.70026	100.6049556	98.5626187	96.57154321	94.63009541	92.73670651	90.88986948	89.08813609	87.33011416
220527A00014	5/27/2022	2.99	5/27/2026	5/27/2022	108.32486	104.8978396	101.5985062	98.42142926	95.36144284	92.41362666	89.57329321	86.83597544	84.1974152
220727A00035	10/24/2022	3.33	10/24/2029	10/24/2022	118.14114	111.1191584	104.5716713	98.46402108	92.76425311	87.44289283	82.47274116	77.828688	73.48754179
221213A00004	12/13/2022	3.99	12/13/2027	12/13/2022	117.7588	112.5911016	107.6868203	103.0311051	98.6100178	94.41047373	90.42018456	86.62760602	83.02188904
210305A00006	3/8/2021	1.02	8/11/2025	3/8/2021	100.85904	98.31463693	95.84668228	93.45241936	91.12920551	88.87451093	86.68591298	84.56109088	82.49782062
210624A00025	6/24/2021	1.43	6/24/2027	6/24/2021	104.58401	100.1857648	95.99675472	92.00596041	88.20300163	84.57809471	81.12201512	77.82606268	74.682029
220510A00015	5/13/2022	3.13	11/3/2025	5/13/2022	107.06861	104.216683	101.4559049	98.78288949	96.19439097	93.68730107	91.25864242	88.90556237	86.62532703
220916A00045	9/16/2022	4.1	9/16/2032	9/16/2022	133.95263	123.3472984	113.7103731	104.9470736	96.97240383	89.71009447	83.09166349	77.05558237	71.54653566
221129A00059	11/29/2022	4.39	11/27/2026	11/29/2022	115.33521	111.2795886	107.3924606	103.6659311	100.0925135	96.66510923	93.37698578	90.2217559	87.19335802
211214A00014	12/14/2021	1.31	12/13/2024	12/14/2021	100.85972	98.9517925	97.08926232	95.27077782	93.49503419	91.76077402	90.06678522	88.4118991	86.79498846
221027A00061	12/15/2022	4.45	12/15/2027	12/15/2022	120.00211	114.7755687	109.8149108	105.1051575	100.6322478	96.38298126	92.34496131	88.50654183	84.85677804
221027A00063	12/15/2022	4.45	12/15/2027	12/15/2022	120.00211	114.7755687	109.8149108	105.1051575	100.6322478	96.38298126	92.34496131	88.50654183	84.85677804
210224A00002	2/25/2021	0.88	11/3/2025	2/25/2021	100.65891	97.89890505	95.22783811	92.64238612	90.13937211	87.7157539	85.36861758	83.09517148	80.8927403

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220603A00024	6/3/2022	2.94	6/3/2024	6/3/2022	102.68644	101.2721731	99.88427837	98.52207909	97.18492384	95.8721828	94.58324684	93.31752661	92.07445181
200309A00007	3/9/2020	1.11	3/9/2027	3/9/2020	102.85225	98.76972981	94.87026769	91.14467543	87.58427759	84.18088136	80.92674674	77.81455874	74.83740148
200327A00042	3/27/2020	0.83	3/27/2024	3/27/2020	99.817711	98.59791245	97.4076644	96.24590432	95.11162047	94.00384845	92.92166854	91.86420306	90.83061405
201118A00021	11/20/2020	0.97	11/20/2023	11/20/2020	99.801677	98.92197435	98.0576939	97.20843338	96.37380403	95.55343043	94.74694988	93.95401191	93.17427774
220315A00018	3/15/2022	2.43	3/15/2027	3/15/2022	108.42041	104.2057096	100.1791766	96.33136821	92.65337097	89.13676814	85.77360877	82.5563791	79.47797578
221108A00033	11/8/2022	4.7	11/8/2027	11/8/2022	120.8238	115.6802996	110.7932369	106.1484443	101.7326062	97.53320667	93.53847667	89.73734616	86.11939908
221128A00034	11/28/2022	4.27	11/26/2027	11/28/2022	118.97233	113.8224044	108.9322514	104.2873669	99.87413098	95.67974927	91.69219881	87.90017773	84.29305835
200330A00006	3/30/2020	0.9	3/28/2025	3/30/2020	100.74207	98.54530369	96.40665933	94.32417098	92.29595821	90.32021993	88.39523033	86.51933493	84.690947
211028A00019	10/28/2021	1.1	10/28/2024	10/28/2021	100.35978	98.5763968	96.83298043	95.1284024	93.46157183	91.83143546	90.23697619	88.67721149	87.15119209
220425A00027	4/29/2022	3.15	8/20/2026	4/29/2022	109.61785	105.9393887	102.4055384	99.00980005	95.74600405	92.60829343	89.59110588	86.689157	83.89742474
200427A00017	4/27/2020	1.02	4/25/2025	4/27/2020	100.6054	98.34710993	96.1501697	94.01257379	91.93239023	89.90776177	87.93690244	86.0180944	84.14968491
220304A00004	3/4/2022	2.12	12/29/2028	3/4/2022	109.456	103.4913898	97.89110293	92.63100127	87.68866834	83.04327541	78.67546115	74.56722117	70.7018063
220915A00025	9/15/2022	4.34	9/15/2023	9/15/2022	102.29681	101.5822237	100.8776443	100.1828632	99.4976765	98.8218861	98.15529933	97.49772874	96.84899194
210616A00008	5/2/2022	0.95	5/2/2025	5/2/2022	100.4567	98.18195945	95.96948437	93.81724269	91.72327837	89.68570991	87.702727	85.77258749	83.89361438
221031A00036	10/31/2022	4.59	10/29/2027	10/31/2022	120.18002	115.079627	110.2324265	105.6244911	101.2427282	97.0748272	93.10920983	89.33498228	85.7418917
221123A00039	11/23/2022	4.29	11/23/2027	11/23/2022	119.03985	113.8964889	109.0121523	104.372401	99.96367388	95.77323038	91.78909709	88.00001756	84.39540584
221129A00037	11/29/2022	4.56	11/26/2025	11/29/2022	111.41514	108.4388334	105.5590249	102.7720614	100.0744496	97.46284709	94.93405504	92.48501117	90.11278319
200310A00015	3/10/2020	1.37	3/11/2030	3/10/2020	104.90102	97.97593685	91.55125716	85.58831117	80.05160603	74.90855084	70.12920504	65.68604978	61.55378026
201117A00016	11/17/2020	0.52	11/18/2024	11/17/2020	99.679606	97.84158693	96.04604992	94.2917662	92.57755037	90.9022587	89.26478737	87.66407081	86.09908014
210104A00007	11/23/2021	0.88	11/23/2026	11/23/2021	101.60399	97.82590922	94.20730377	90.74065024	87.41881952	84.23505304	81.1829415	78.25640509	75.44967483
220419A00016	4/19/2022	3.21	4/19/2027	4/19/2022	112.00262	107.6180126	103.4321334	99.43491796	95.61686485	91.96900182	88.4828534	85.15041062	81.96410291
221110A00026	11/10/2022	4.29	11/10/2027	11/10/2022	118.85496	113.753242	108.9067785	104.3014286	99.92391006	95.76173962	91.8031804	88.0371938	84.45339447
200305A00030	3/5/2020	1.58	3/5/2030	3/5/2020	106.39396	99.43166313	92.97032747	86.97135728	81.39932292	76.22168358	71.40853741	66.93239456	62.76797083
200414A00014	4/14/2020	0.76	4/12/2024	4/14/2020	99.758132	98.49781163	97.2644892	96.05729882	94.87541222	93.71803627	92.58441107	91.47380825	90.38552931
201029A00002	10/29/2020	0.59	10/29/2025	10/29/2020	100.41481	97.65773182	94.98940812	92.40653064	89.90592931	87.48456873	85.1395417	82.86806304	80.66746386
210629A00012	6/29/2021	1.14	12/29/2025	6/29/2021	101.54921	98.63053232	95.81052165	93.08530736	90.45119501	87.90465539	85.44231608	83.06095356	80.75748574
220412A00017	4/12/2022	3.09	3/19/2027	4/12/2022	111.22928	106.9448949	102.8514982	98.93950212	95.19985682	91.62401723	88.20391183	84.93191348	81.80081213
220418A00015	4/22/2022	3.03	7/28/2025	4/22/2022	106.01515	103.4397436	100.9404221	98.51447624	96.15931322	93.87244926	91.65150408	89.49419591	87.39833665
220425A00026	4/25/2022	3.13	2/25/2026	4/25/2022	108.01765	104.8423197	101.7776952	98.81926183	95.96272094	93.20397564	90.53911992	87.96442843	85.4763469
210224A00004	2/26/2021	0.91	12/18/2025	2/26/2021	100.83501	97.95605033	95.17355373	92.48377878	89.88314601	87.36823436	84.93577322	82.58263495	80.30582776
221110A00108	11/10/2022	4.48	12/10/2025	11/10/2022	111.3478	108.3339642	105.4190656	102.59931	99.87107258	97.23088725	94.67543877	92.2015553	89.80620134
220311A00008	3/11/2022	2.07	3/11/2024	3/11/2022	101.07397	99.89179031	98.7371604	97.6091279	96.50678181	95.42925235	94.37570859	93.34535634	92.33743616
200305A00032	3/5/2020	1.58	3/5/2030	3/5/2020	106.39396	99.43166313	92.97032747	86.97135728	81.39932292	76.22168358	71.40853741	66.93239456	62.76797083

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200403A00018	4/3/2020	0.91	4/3/2024	4/3/2020	99.693749	98.46038356	97.25588242	96.07923632	94.92948306	93.80570441	92.70702369	91.63260339	90.58164301
200225A00034	10/5/2020	1.5	10/5/2023	10/5/2020	100.26325	99.50342281	98.75506539	98.01792014	97.29173661	96.57627174	95.87128961	95.17656121	94.49186411
200317A00027	3/17/2020	1.29	3/17/2025	3/17/2020	101.11779	98.95548632	96.84959352	94.79823261	92.79960376	90.8519818	88.95371244	87.10320868	85.29894745
220412A00016	4/12/2022	3.09	3/19/2027	4/12/2022	111.22928	106.9448949	102.8514982	98.93950212	95.19985682	91.62401723	88.20391183	84.93191348	81.80081213
221129A00076	11/29/2022	4.38	12/1/2026	11/29/2022	115.34425	111.2774871	107.3801117	103.6441676	100.0621104	96.62678749	93.33141632	90.16956294	87.13512234
200429A00054	4/29/2020	1.04	4/29/2025	4/29/2020	100.66058	98.39131189	96.18394534	94.03646365	91.94692472	89.91346049	87.93427369	86.00763476	84.13187885
211213A00010	12/13/2021	1.02	12/13/2023	12/13/2021	99.832624	98.89203039	97.96905881	97.06321743	96.17403298	95.30104947	94.44382743	93.60194315	92.774988
220421A00016	4/21/2022	3.31	4/21/2026	4/21/2022	109.08531	105.7433255	102.5224223	99.41755655	96.42392408	93.53694691	90.75226106	88.06570536	85.47331077
221107A00053	11/7/2022	4.95	10/7/2025	11/7/2022	111.89672	109.0508251	106.2932355	103.6206504	101.0299186	98.5180284	96.08209989	93.71937829	91.42722753
221117A00013	11/17/2022	4.54	11/14/2025	11/17/2022	111.21523	108.2741617	105.4275051	102.6717261	100.0034391	97.41940332	94.91651582	92.49180466	90.14242277
200406A00060	4/6/2020	1.03	4/5/2024	4/6/2020	99.850697	98.61121955	97.40017542	96.21658805	95.05952553	93.92809793	92.82145492	91.73878365	90.67930661
210907A00015	9/9/2021	2.21	9/9/2026	9/9/2021	106.32075	102.649776	99.12550375	95.7412405	92.49064107	89.36768671	86.3666661	83.48215763	80.70901277
211209A00007	12/9/2021	1.61	12/8/2026	12/9/2021	104.51785	100.6438361	96.93428719	93.38138604	89.97772501	86.71628495	83.59041284	80.59380075	77.72046611
220112A00008	1/12/2022	1.47	11/20/2024	1/12/2022	101.09618	99.24641137	97.43932607	95.67368954	93.94831108	92.26204182	90.61377298	89.00243418	87.42699189
220706A00032	7/6/2022	3.15	7/6/2027	7/6/2022	113.38813	108.7317068	104.2963396	100.0703467	96.04272746	92.20311726	88.54174747	85.04940794	81.71741207
220711A00021	7/11/2022	3.27	7/11/2025	7/11/2022	107.02862	104.4752461	101.9964887	99.58972985	97.25245686	94.98226084	92.77683181	90.63395394	88.55150105
220812A00002	8/12/2022	3.17	8/12/2027	8/12/2022	113.80644	109.0375381	104.4990273	100.1785145	96.06434547	92.14555322	88.41181313	84.85340185	81.46115895
210330A00021	3/30/2021	2.16	3/28/2031	3/30/2021	111.66164	103.5343444	96.06359019	89.1927957	82.87053754	77.05005556	71.68880704	66.74806582	62.19256137
220420A00061	6/15/2022	3.3	6/15/2027	6/15/2022	112.88502	108.3263599	103.9810014	99.83783858	95.88639738	92.11680045	88.51973009	85.08639365	81.8084912
220308A00011	3/8/2022	2.07	1/10/2025	3/8/2022	102.49324	100.4944708	98.54470766	96.64244124	94.786215	92.9746275	91.20632987	89.48002341	87.79445741
220314A00006	3/14/2022	2.36	3/14/2025	3/14/2022	103.4735	101.2927231	99.16852369	97.09902876	95.0824407	93.1170362	91.20116239	89.33323333	87.51172671
200310A00038	3/10/2020	1.41	3/11/2030	3/10/2020	105.18678	98.2516798	91.81749791	85.84552846	80.30024973	75.14904393	70.3619454	65.91141189	61.77211676
200413A00003	4/13/2020	0.64	4/13/2023	4/13/2020	99.987547	99.70045901	99.41503202	99.13125117	98.84910215	98.56857078	98.28964306	98.01230515	97.73654338
210706A00006	7/6/2021	1.15	7/6/2026	7/6/2021	102.18198	98.75657117	95.46359835	92.29724464	89.25197976	86.32254548	83.50394065	80.79140716	78.18041673
211014A00018	10/14/2021	0.8	10/11/2024	10/14/2021	100.1301	98.38810745	96.68437272	95.01775764	93.38717099	91.79156344	90.22992556	88.70128589	87.20470911
220614A00011	6/14/2022	3.71	6/14/2024	6/14/2022	103.88644	102.4342454	101.0096452	99.61191732	98.24036746	96.89432484	95.57314112	94.27618946	93.00286366
220711A00009	7/11/2022	3.36	7/11/2023	7/11/2022	101.2564	100.7240353	100.1972755	99.67602937	99.16021058	98.64973453	98.1445184	97.64448104	97.14954301
221028A00027	10/28/2022	4.73	10/28/2024	10/28/2022	107.02697	105.1807315	103.3756339	101.6105122	99.88424402	98.19574595	96.5439717	94.9279107	93.3465866
201028A00013	10/28/2020	0.68	10/28/2024	10/28/2020	99.588372	97.8122589	96.0759792	94.37840623	92.71845273	91.09506896	89.50724117	87.9539901	86.43436958
221021A00026	10/21/2022	4.94	10/23/2023	10/21/2022	103.08699	102.2666859	101.4594817	100.6650667	99.88313802	99.11340252	98.35557607	97.60938336	96.8745575
200318A00037	3/18/2020	1.35	3/18/2024	3/18/2020	100.22566	99.0303416	97.86335619	96.72370565	95.61043878	94.52264808	93.45946722	92.42006876	91.40366198
220209A00013	2/9/2022	1.98	7/29/2025	2/9/2022	103.30979	100.7669764	98.29958654	95.90492844	93.58042633	91.32361278	89.13212341	87.00369181	84.93614483
220317A00010	3/17/2022	2.04	9/15/2023	3/17/2022	100.64861	99.94058342	99.24250069	98.55415189	97.87533434	97.20585095	96.54551006	95.8941252	95.25151497

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220317A00023	5/3/2022	2.52	5/2/2025	5/3/2022	104.13711	101.8186044	99.56329114	97.36911274	95.23408659	93.15630562	91.13393498	89.16520884	87.24842742
221213A00047	12/13/2022	3.8	12/13/2027	12/13/2022	117.94048	112.7331113	107.7921241	103.1024579	98.64997795	94.421417	90.40431785	86.58697968	82.95840828
221207A00074	12/7/2022	4.66	12/6/2024	12/7/2022	107.34751	105.3937039	103.4856595	101.6220273	99.80150615	98.02284168	96.28482433	94.58628742	92.92610531
200304A00019	3/4/2020	1.04	3/6/2023	3/4/2020	100.05922	99.87687144	99.69519292	99.51418103	99.3338321	99.15414245	98.97510847	98.79672654	98.61899309
200327A00035	3/27/2020	0.83	3/27/2024	3/27/2020	99.817711	98.59791245	97.4076644	96.24590432	95.11162047	94.00384845	92.92166854	91.86420306	90.83061405
200415A00023	4/15/2020	1.71	4/15/2030	4/15/2020	107.38078	100.2815808	93.69958735	87.59449242	81.92932683	76.67016516	71.78586065	67.24780428	63.02970608
220412A00010	4/12/2022	3.09	3/15/2027	4/12/2022	111.19493	106.92227	102.8396544	98.93756735	95.20702233	91.63953315	88.22708269	84.96209415	81.83740407
201021A00012	10/21/2020	1.85	10/19/2035	10/21/2020	109.54234	97.62053205	87.12647345	77.88095777	69.72811745	62.53228482	56.17528564	50.55410661	45.57888379
200304A00022	3/4/2020	0.86	3/6/2023	3/4/2020	100.06272	99.87999098	99.69793533	99.5165519	99.33583691	99.15578661	98.9763973	98.79766529	98.61958692
210729A00003	7/29/2021	1.11	7/29/2026	7/29/2021	102.12264	98.63703516	95.28805576	92.069612	88.97592179	86.0014922	83.14110324	80.38979266	77.74284166
220325A00010	3/28/2022	2.78	3/21/2025	3/28/2022	104.4526	102.2418106	100.088711	97.99137367	95.94795349	93.95668205	92.01586389	90.12387283	88.27914842
221114A00002	11/14/2022	4.37	11/15/2027	11/14/2022	119.34822	114.2193177	109.3475605	104.7186777	100.3192591	96.13670294	92.15916282	88.37549887	84.77523209
221129A00064	11/29/2022	4.28	11/30/2027	11/29/2022	119.06191	113.8988881	108.996794	104.3410337	99.91790162	95.71452486	91.71880811	87.91938287	84.30556015
200220A00014	2/20/2020	2.09	12/21/2029	2/20/2020	109.84555	102.9532222	96.54211225	90.57612962	85.02206662	79.84935328	75.02983535	70.537572	66.34865138
200302A00002	3/2/2020	1.12	3/3/2025	3/2/2020	101.1555	99.02121586	96.9420134	94.91608137	92.94168413	91.01715689	89.14090216	87.31138642	85.52713699
200306A00055	3/6/2020	0.82	3/6/2025	3/6/2020	100.50725	98.372134	96.29232356	94.26599336	92.29139451	90.36684983	88.49075023	86.66155134	84.87777027
200521A00013	5/21/2020	2.09	5/21/2035	5/21/2020	112.62957	100.8548324	90.44435106	81.23198377	73.07262076	65.8394288	59.42146838	53.72163174	48.65485708
210518A00023	5/18/2021	1.17	5/18/2026	5/18/2021	102.09234	98.79541015	95.6215017	92.56540733	89.62216296	86.78703949	84.05553038	81.42334003	78.88637276
220420A00034	6/15/2022	3.3	6/15/2027	6/15/2022	112.88502	108.3263599	103.9810014	99.83783858	95.88639738	92.11680045	88.51973009	85.08639365	81.8084912
221129A00053	11/29/2022	4.56	12/2/2025	11/29/2022	111.48682	108.4931331	105.5970055	102.7947208	100.08273	97.4576384	94.9161977	92.45529916	90.07196662
221206A00011	12/6/2022	4.29	12/7/2026	12/6/2022	115.06309	110.9850116	107.0775372	103.3326189	99.74262739	96.30033144	92.99887545	89.83175774	86.79281043
221213A00042	12/13/2022	4.49	3/13/2025	12/13/2022	108.16996	105.9391391	103.765852	101.6481994	99.5843591	97.57258422	95.61119901	93.6985954	91.83322966
200415A00036	4/15/2020	0.91	10/15/2024	4/15/2020	99.984298	98.23923864	96.53261515	94.86330199	93.23021629	91.63231568	90.06859641	88.53809157	87.03986939
221216A00007	12/16/2022	4.27	12/16/2025	12/16/2022	110.79635	107.7741077	104.8516759	102.0252061	99.29102132	96.64560661	94.08560079	91.60778894	89.20909514
221214A00022	12/14/2022	4.17	2/13/2026	12/14/2022	111.16219	107.9715359	104.8907432	101.9153843	99.0412368	96.2642745	93.58065651	90.98671763	88.4789591
200402A00041	4/2/2020	1.03	4/2/2025	4/2/2020	100.5794	98.38080531	96.24052129	94.15658078	92.12710427	90.15029081	88.22441396	86.34781801	84.51891441
200327A00055	3/27/2020	1.01	3/27/2024	3/27/2020	99.81078	98.59460646	97.4078352	96.24941128	95.11832966	94.01363227	92.93440533	91.8797768	90.848914
221216A00045	12/16/2022	4.38	5/16/2025	12/16/2022	108.65943	106.2484515	103.9038358	101.6233917	99.40501038	97.24666472	95.14640553	93.10235814	91.11271908
200306A00013	3/6/2020	1.01	3/6/2025	3/6/2020	100.47005	98.34434082	96.27353684	94.25582757	92.28948112	90.3728364	88.50429957	86.68234071	84.90549069
201223A00012	12/23/2020	0.91	12/18/2026	12/23/2020	101.78762	97.94093935	94.25929812	90.73478096	87.35989321	84.12753653	81.03098584	78.06386771	75.22014009
220106A00010	1/6/2022	2.64	1/6/2037	1/6/2022	119.3867	105.8781575	94.09605148	83.80793535	74.81385559	66.94166335	60.0430205	53.98999663	48.67216707
220714A00034	7/14/2022	3.62	1/16/2024	7/14/2022	102.56961	101.5239403	100.4996244	99.49600867	98.51246955	97.54840825	96.60324962	95.67644099	94.76745105
221025A00027	10/25/2022	4.57	10/25/2027	10/25/2022	120.0377	114.9520777	110.1184288	105.5229048	101.1524874	96.99493667	93.03874128	89.27307078	85.68773217

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210201A00003	2/2/2021	0.74	10/15/2025	2/2/2021	100.22759	97.52370919	94.90554308	92.36988454	89.91366497	87.53394961	85.22793068	82.99292107	80.82634824
221118A00080	11/18/2022	4.61	11/18/2025	11/18/2022	111.46473	108.5092588	105.6489549	102.880245	100.1997059	97.60406108	95.09017397	92.65504089	90.2957848
201117A00017	11/17/2020	0.39	11/17/2023	11/17/2020	99.461306	98.58878907	97.73147716	96.88897614	96.060905	95.2468957	94.44659263	93.65965208	92.88574175
220823A00034	8/23/2022	3.61	8/23/2024	8/23/2022	104.34644	102.7027874	101.0929738	99.51602205	97.97098843	96.4569652	94.97307898	93.51848916	92.09238626
200429A00066	4/29/2020	0.8	4/28/2023	4/29/2020	99.969062	99.64157857	99.31623296	98.9930048	98.67187353	98.35281884	98.03582069	97.72085928	97.40791508
210224A00003	2/26/2021	0.9	12/3/2025	2/26/2021	100.77316	97.9346017	95.18988604	92.53541971	89.96776633	87.48363932	85.0798946	82.75352349	80.5016462
210624A00026	6/24/2021	1.6	6/23/2028	6/24/2021	106.24658	100.860165	95.77884481	90.98380253	86.4574715	82.18344956	78.14641605	74.33205519	70.72698527
210916A00008	9/16/2021	1.48	9/15/2028	9/16/2021	105.6305	100.0457585	94.78883806	89.83880044	85.17615922	80.7827669	76.64171566	72.73724601	69.05466268
220707A00041	7/7/2022	3.41	7/7/2025	7/7/2022	106.80388	104.2759131	101.8214035	99.43778248	97.12259109	94.87347136	92.68816141	90.56449087	88.5003766
220920A00026	9/20/2022	4.1	9/20/2027	9/20/2022	117.47051	112.5421668	107.8544414	103.3942211	99.14918135	95.10773586	91.25898802	87.59268569	84.09917925
221027A00047	10/27/2022	4.88	4/26/2024	10/27/2022	105.02558	103.6968586	102.3925125	101.1119039	99.8544178	98.61946064	97.406459	96.21485887	95.04412482
200305A00006	3/5/2020	0.99	3/6/2023	3/5/2020	100.05006	99.86772473	99.68605861	99.50505909	99.32472248	99.14504513	98.9660234	98.7876537	98.60993244
220217A00016	2/17/2022	2.24	9/15/2026	2/17/2022	106.46906	102.7796467	99.23817798	95.83788435	92.57234439	89.43546844	86.42147918	83.52489356	80.74050582
221129A00040	11/29/2022	4.56	11/26/2025	11/29/2022	111.41514	108.4388334	105.5590249	102.7720614	100.0744496	97.46284709	94.93405504	92.48501117	90.11278319
221205A00048	12/5/2022	4.4	12/5/2025	12/5/2022	111.05341	108.0577976	105.1601139	102.3566257	99.64375991	97.01809931	94.47637466	92.01545748	89.63235314
220425A00028	4/29/2022	3.16	4/23/2027	4/29/2022	111.82102	107.4295737	103.2376727	99.23519812	95.41260139	91.76086497	88.27146989	84.93636563	81.74794185
221003A00067	10/3/2022	4.48	11/13/2024	10/3/2022	106.73299	104.8469919	103.0039071	101.2025029	99.4415933	97.7200338	96.03671943	94.3905832	92.78059455
221129A00051	11/29/2022	4.56	12/2/2025	11/29/2022	111.48682	108.4931331	105.5970055	102.7947208	100.08273	97.4576384	94.9161977	92.45529916	90.07196662
200402A00030	4/2/2020	0.8	4/3/2023	4/2/2020	99.98386	99.72477534	99.46703325	99.21062334	98.95553531	98.70175894	98.44928415	98.19810093	97.94819939
201105A00016	11/9/2020	2.18	11/8/2027	11/9/2020	108.59795	103.7479325	99.14364577	94.77140453	90.61835065	86.67240136	82.92219868	79.35706245	75.96694659
201119A00021	11/23/2020	2.22	11/21/2030	11/23/2020	111.73035	103.9225937	96.72163924	90.07713077	83.94313161	78.27771605	73.04260072	68.20281153	63.72638251
220609A00034	10/3/2022	3.32	9/30/2024	10/3/2022	104.1958	102.4527767	100.7472239	99.07799707	97.44399944	95.84417888	94.2775255	92.74306951	91.23987919
220915A00033	9/15/2022	4.3	3/15/2024	9/15/2022	103.81009	102.5996309	101.4175066	100.2627327	99.13436646	98.03150786	96.95329747	95.89891412	94.86757278
221031A00035	10/31/2022	4.67	10/30/2026	10/31/2022	116.0721	112.0787454	108.2482177	104.5730175	101.0460335	97.66051629	94.41005809	91.28857389	88.29028343
200302A00016	3/2/2020	1.36	3/3/2025	3/2/2020	101.22598	99.0998821	97.02848465	95.00999806	93.04270284	91.1249495	89.25515505	87.4317997	85.6534238
200305A00014	3/10/2020	1	2/15/2023	3/10/2020	100.06242	99.93234314	99.8026135	99.67323344	99.54420152	99.41551631	99.28717639	99.15918034	99.03152674
210211A00007	2/11/2021	0.47	9/15/2023	2/11/2021	99.523531	98.81998552	98.12633742	97.44237938	96.76790947	96.1027313	95.4466539	94.79949148	94.1610633
210624A00002	6/24/2021	0.57	6/23/2023	6/24/2021	99.804028	99.32473388	98.85002985	98.37985024	97.91413059	97.45280767	96.99581943	96.54310499	96.0946046
220214A00010	2/14/2022	2.46	12/21/2029	2/14/2022	112.41052	105.4309467	98.93691558	92.89208015	87.2629933	82.01886158	77.13132206	72.57423889	68.32351797
220325A00015	3/28/2022	2.86	3/23/2027	3/28/2022	110.29173	106.016028	101.9315945	98.02879846	94.29855194	90.73227544	87.32186632	84.05966924	80.93844871
220823A00015	8/23/2022	3.78	8/30/2032	8/23/2022	128.39829	118.2153961	108.9595954	100.540553	92.87721022	85.89678857	79.53390314	73.7297756	68.43153446
200318A00047	3/18/2020	1.29	3/18/2025	3/18/2020	101.58353	99.40405779	97.28163568	95.21435995	93.2004043	91.23801853	89.32552462	87.46131303	85.64383932
200421A00024	4/24/2020	0.8	10/16/2023	4/24/2020	99.706226	98.91955799	98.14523944	97.38298156	96.63250432	95.89353629	95.16581434	94.44908331	93.7430957

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200327A00027	3/27/2020	0.9	3/27/2023	3/27/2020	100.01445	99.77450103	99.53570019	99.29804129	99.06151618	98.82611678	98.5918351	98.35866322	98.12659329
220722A00051	9/15/2022	3.23	9/15/2027	9/15/2022	113.32587	108.5077566	103.9255711	99.56645285	95.41831333	91.46978747	87.71018606	84.12945158	80.71811718
221027A00009	10/27/2022	4.68	10/27/2025	10/27/2022	111.39788	108.5030394	105.6996846	102.9844265	100.3540221	97.80536598	95.3354838	92.94152584	90.62076108
221129A00046	11/29/2022	4.56	12/1/2025	11/29/2022	111.4747	108.4839711	105.5906176	102.7909348	100.0813832	97.45857733	94.91927759	92.46038332	90.07892605
200417A00013	4/17/2020	0.74	4/17/2023	4/17/2020	99.955773	99.65842561	99.36285435	99.06904351	98.77697733	98.48664024	98.19801685	97.91109196	97.62585056
210104A00006	11/22/2021	0.88	11/20/2026	11/22/2021	101.59667	97.82636629	94.21490575	90.75481013	87.43899128	84.26072866	81.21364846	78.29170383	75.48915652
210112A00003	1/12/2021	0.53	9/15/2023	1/12/2021	99.566528	98.86281092	98.16899334	97.48486751	96.81023144	96.14488874	95.4886484	94.84132462	94.20273661
211028A00012	10/28/2021	1.64	10/15/2027	10/28/2021	105.89959	101.1773941	96.6923632	92.43136451	88.38206236	84.53286479	80.87287467	77.39184429	74.0801332
220124A00009	1/24/2022	0.86	1/24/2023	1/24/2022	100.04378	99.97446194	99.9052523	99.83614886	99.76715136	99.69825958	99.62947327	99.56079219	99.4922161
220428A00016	5/2/2022	3.09	10/15/2024	5/2/2022	103.91087	102.1294553	100.3871497	98.68280654	97.01532508	95.38364559	93.78674764	92.22364823	90.69340012
220628A00034	6/28/2022	3.61	6/28/2027	6/28/2022	114.38575	109.7590158	105.3499533	101.1471482	97.13984714	93.31791387	89.67179047	86.19246136	82.8714197
200402A00038	4/2/2020	0.84	4/2/2025	4/2/2020	100.61845	98.40993195	96.26015866	94.16714382	92.12898929	90.14387647	88.21006221	86.32587494	84.48971111
200415A00031	4/15/2020	0.97	4/15/2025	4/15/2020	100.46937	98.23847887	96.06757965	93.95468284	91.89788091	89.89534268	87.94530964	86.04609246	84.19606776
220315A00021	3/15/2022	2.15	3/15/2024	3/15/2022	101.19533	100.0016558	98.83604305	97.69751386	96.58513254	95.49800602	94.43528155	93.39614436	92.37981561
200326A00011	3/30/2020	1.54	3/31/2025	3/30/2020	101.72613	99.51955901	97.37130654	95.2794049	93.24197114	91.25720146	89.32336714	87.4388107	85.60194226
200421A00031	4/21/2020	0.84	4/19/2024	4/21/2020	99.634795	98.36136278	97.11321753	95.88961921	94.68985669	93.51324656	92.35913166	91.22687987	90.11588291
210225A00007	2/25/2021	1.79	8/23/2030	2/25/2021	108.19601	100.7449066	93.85958357	87.49415357	81.60667875	76.15880847	71.11545504	66.44450044	62.11653079
210319A00003	3/19/2021	0.95	3/19/2025	3/19/2021	100.36793	98.20876579	96.10608893	94.05801159	92.06272714	90.11850409	88.22368229	86.37666931	84.57593703
211117A00009	11/17/2021	0.84	11/17/2023	11/17/2021	99.688537	98.81731337	97.96123154	97.1198992	96.29293783	95.47998179	94.68067774	93.89468416	93.12167081
220921A00069	9/21/2022	3.98	9/21/2027	9/21/2022	117.98526	113.0095653	108.277668	103.7762347	99.49274029	95.41541233	91.53318133	87.83563459	84.31297327
200527A00013	5/27/2020	1.13	11/25/2026	5/27/2020	102.58482	98.78257567	95.14081025	91.65194648	88.30880645	85.10458563	82.03283148	79.08742348	76.26255429
201119A00003	11/19/2020	0.56	11/17/2023	11/19/2020	99.439384	98.5693635	97.71446995	96.87431152	96.04850999	95.23670002	94.43852852	93.65365424	92.88174721
210914A00015	9/14/2021	0.81	9/15/2025	9/14/2021	100.93244	98.2844512	95.71846914	93.23143646	90.82042835	88.48264993	86.21542937	84.01621153	81.88255185
220629A00003	6/29/2022	3.59	6/29/2027	6/29/2022	114.3051	109.6774812	105.2677245	101.0643962	97.05672752	93.23456772	89.58834577	86.10903403	82.78811457
220912A00051	11/15/2022	3.76	11/15/2027	11/15/2022	116.37644	111.3191546	106.5163989	101.9540143	97.61870291	93.49796919	89.58006772	85.85395433	82.30924083
220502A00025	5/2/2022	3.21	5/2/2025	5/2/2022	105.75462	103.4168751	101.1427349	98.93012569	96.77705325	94.68159928	92.64191811	90.65623351	88.72283569
221117A00008	11/17/2022	4.82	11/15/2024	11/17/2022	107.4162	105.5179237	103.6629266	101.8499656	100.0778415	98.34539721	96.65151573	94.99511856	93.37516411
221130A00039	11/30/2022	5.16	11/30/2023	11/30/2022	103.67125	102.7457984	101.8369341	100.9442162	100.0672165	99.2055222	98.35873443	97.52646829	96.70835198
210623A00026	6/23/2021	0.78	6/24/2024	6/23/2021	99.600163	98.15494344	96.73772319	95.3477615	93.98434305	92.64677705	91.33439615	90.04655546	88.78263165
221018A00031	10/18/2022	4.71	10/17/2025	10/18/2022	111.35672	108.490407	105.7138788	103.0238016	100.4169818	97.89036465	95.44102626	93.0661677	90.76310857
200304A00035	3/4/2020	1.17	3/4/2025	3/4/2020	100.81454	98.69033435	96.62086322	94.6043293	92.63900998	90.72325287	88.85547229	87.03414599	85.25781202
220201A00011	2/1/2022	1.86	4/20/2026	2/1/2022	104.28169	101.0219318	97.88092696	94.85371586	91.93557339	89.12199738	86.40869672	83.79158022	81.2667461
220217A00018	2/17/2022	2.28	2/17/2027	2/17/2022	107.61884	103.4923301	99.54755716	95.77553578	92.16777188	88.71623705	85.41334016	82.25190102	79.22512566

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220412A00018	4/12/2022	3.09	3/15/2027	4/12/2022	111.19493	106.92227	102.8396544	98.93756735	95.20702233	91.63953315	88.22708269	84.96209415	81.83740407
200429A00004	5/1/2020	0.74	5/1/2023	5/1/2020	99.946647	99.61101634	99.27762938	98.94646414	98.61749856	98.29071082	97.96607942	97.64358314	97.323201
220224A00010	2/24/2022	2.04	3/10/2025	2/24/2022	102.74526	100.5834386	98.4775335	96.42569621	94.42615723	92.47721972	90.5772559	88.72470356	86.91806284
221123A00034	11/23/2022	4.43	11/23/2026	11/23/2022	115.4431	111.3962673	107.5171184	103.797813	100.2309187	96.80938738	93.52653332	90.37601289	87.35180505
210208A00002	2/10/2021	0.45	6/15/2023	2/10/2021	99.766867	99.30928972	98.85590384	98.40665183	97.96147725	97.52032468	97.08313974	96.649869	96.22045997
220419A00015	4/19/2022	3.14	4/17/2026	4/19/2022	108.48892	105.1674632	101.9660785	98.87976344	95.90375143	93.03350136	90.26468539	87.59317765	85.01504357
221019A00009	10/19/2022	4.8	10/17/2025	10/19/2022	111.60894	108.7390629	105.9590586	103.2655874	100.6554534	98.12559915	95.67309838	93.29514983	90.98907089
200114A00021	1/11/2021	1.93	1/11/2024	1/11/2021	100.77663	99.75426757	98.75257802	97.7709356	96.80874301	95.86542648	94.94043464	94.03323738	93.1433249
200402A00014	4/2/2020	0.84	4/2/2025	4/2/2020	100.61845	98.40993195	96.26015866	94.16714382	92.12898929	90.14387647	88.21006221	86.32587494	84.48971111
200413A00012	4/13/2020	0.64	4/13/2023	4/13/2020	99.987547	99.70045901	99.41503202	99.13125117	98.84910215	98.56857078	98.28964306	98.01230515	97.73654338
220915A00039	9/15/2022	4.29	4/15/2024	9/15/2022	104.11585	102.8219133	101.5546697	100.3132963	99.09700411	97.90503694	96.73666895	95.59120339	94.46797112
221118A00023	11/18/2022	4.12	11/18/2027	11/18/2022	119.27285	114.1029983	109.1937478	104.5305657	100.099802	95.888633	91.88500752	88.07759616	84.45574458
221205A00024	12/5/2022	4.13	12/3/2027	12/5/2022	118.35421	113.1999656	108.3068597	103.6602546	99.24640717	95.05241057	91.06613919	87.27619747	83.67187224
200916A00017	9/16/2020	0.54	9/15/2023	9/16/2020	99.573694	98.86994848	98.17610266	97.49194886	96.8172851	96.15191498	95.49564748	94.84829681	94.20968217
220314A00005	3/14/2022	2.36	3/14/2025	3/14/2022	103.4735	101.2927231	99.16852369	97.09902876	95.0824407	93.1170362	91.20116239	89.33323333	87.51172671
200417A00006	4/17/2020	0.74	4/17/2023	4/17/2020	99.955773	99.65842561	99.36285435	99.06904351	98.77697733	98.48664024	98.19801685	97.91109196	97.62585056
211015A00029	10/15/2021	0.98	10/15/2024	10/15/2021	100.11038	98.36415385	96.65638461	94.98594663	93.35175648	91.75277123	90.18798659	88.65643513	87.1571846
220131A00011	1/31/2022	1.52	1/31/2024	1/31/2022	100.37082	99.29803393	98.24805517	97.22015912	96.21365533	95.22788187	94.26220382	93.31601199	92.38872154
221220A00025	12/20/2022	4.38	12/22/2025	12/20/2022	111.19238	108.1476267	105.2039158	102.3573292	99.60412616	96.94073167	94.36372803	91.86984709	89.45596274
200218A00026	2/21/2020	1.73	3/25/2024	2/21/2020	100.70582	99.48900846	98.30145293	97.14210456	96.00996801	94.90409428	93.82357799	92.767555	91.7352
200330A00064	3/30/2020	0.83	3/30/2023	3/30/2020	99.994244	99.74609784	99.49917554	99.25346821	99.00896698	98.76566304	98.52354768	98.28261226	98.04284824
210225A00013	3/1/2021	0.93	10/6/2025	3/1/2021	100.73833	98.05116359	95.44843643	92.92697624	90.48374998	88.11585936	85.82053376	83.59512364	81.43709423
220308A00016	3/8/2022	2.37	3/8/2029	3/8/2022	111.11708	104.9205995	99.11191589	93.66469667	88.5545348	83.75879733	79.25648708	75.02811592	71.05558852
221122A00029	11/22/2022	4.31	11/22/2027	11/22/2022	119.1275	113.9847487	109.100835	104.4613345	100.0527027	95.86221486	91.87791179	88.08855003	84.48355551
200316A00072	3/16/2020	1.18	3/16/2023	3/16/2020	100.08351	99.87365118	99.66467847	99.45659097	99.24938302	99.043049	98.83758335	98.63298054	98.42923512
220317A00028	5/3/2022	2.59	5/3/2027	5/3/2022	109.43244	105.0654442	100.8986576	96.92188975	93.12551662	89.50044938	86.03810191	82.73036048	79.56955549
200228A00091	2/28/2020	1.72	12/7/2029	2/28/2020	107.26467	100.4954335	94.19810666	88.33741903	82.88090291	77.7986588	73.06314031	68.64895795	64.53270036
200916A00019	9/16/2020	0.42	9/16/2024	9/16/2020	99.422648	97.7529817	96.11886436	94.51922673	92.95304233	91.41932567	89.9171302	88.44554631	87.00369953
210129A00002	2/3/2021	0.59	7/25/2024	2/3/2021	99.339463	97.81378892	96.31870615	94.8533629	93.41693871	92.00864297	90.62771355	89.2734155	87.94503985
200221A00023	2/21/2020	2.05	12/7/2029	2/21/2020	109.54011	102.6938859	96.32336735	90.3930621	84.870293	79.72496504	74.92934916	70.4578852	66.28700217
200331A00022	4/1/2020	1.07	4/1/2025	4/1/2020	100.66764	98.47062004	96.33179776	94.24921059	92.22098058	90.24530849	88.32046978	86.44481076	84.61674504
200909A00001	9/9/2020	0.98	9/8/2028	9/9/2020	104.04702	98.47924449	93.23947468	88.30672998	83.66148162	79.28554372	75.16197375	71.27498084	67.60984149
200922A00015	9/24/2020	1.09	9/24/2025	9/24/2020	101.15083	98.48928472	95.91048782	93.41133036	90.98884766	88.64020761	86.36270356	84.15374779	82.01086524

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
201019A00007	10/19/2020	0.64	10/21/2024	10/19/2020	99.505791	97.74914114	96.03151849	94.35179868	92.70889841	91.10177345	89.52941694	87.99085772	86.48515878
220526A00010	5/26/2022	3	5/26/2026	5/26/2022	108.35052	104.9257988	101.6285703	98.45342532	95.39520912	92.44901188	89.61015589	86.87418326	84.23684443
220912A00044	11/15/2022	3.85	11/14/2025	11/15/2022	109.2289	106.316608	103.4980324	100.7696572	98.1281187	95.570197	93.0928092	90.69300272	88.36794905
221129A00054	11/29/2022	4.56	12/3/2025	11/29/2022	111.49893	108.5022953	105.6033937	102.7985076	100.0840781	97.45670136	94.91312043	92.4502184	90.06501145
200317A00045	3/19/2020	1.43	3/19/2025	3/19/2020	101.43552	99.26428156	97.14977825	95.0901156	93.08347994	91.1281331	89.22240843	87.36470728	85.55349554
210729A00004	7/29/2021	1.74	7/29/2031	7/29/2021	108.46832	100.1680394	92.5661339	85.60020571	79.21373143	73.35548087	67.97899668	63.04212767	58.50660979
221107A00048	11/7/2022	4.96	9/8/2025	11/7/2022	111.54545	108.783633	106.1055333	103.5080741	100.988312	98.54343239	96.17074288	93.86766719	91.63173905
200302A00005	3/2/2020	1.31	3/3/2025	3/2/2020	101.11696	98.99206782	96.92185545	94.90453003	92.93837279	91.02173489	89.15303395	87.33075083	85.55342645
200327A00043	3/27/2020	1.48	3/27/2028	3/27/2020	106.68199	101.4713162	96.54477728	91.88538443	87.47725597	83.30554073	79.35634524	75.61666653	72.07433007
200330A00028	3/30/2020	1.09	3/28/2025	3/30/2020	100.70296	98.51603913	96.38680474	94.31331678	92.29371322	90.3262104	88.40909896	86.54074005	84.71956176
201123A00010	11/25/2020	1.48	11/24/2025	11/25/2020	102.44092	99.60120298	96.85443744	94.19709172	91.62579075	89.13730533	86.72854504	84.39655142	82.13849165
210311A00007	3/11/2021	1.06	3/11/2026	3/11/2021	101.52062	98.41087005	95.41155916	92.51812163	89.72620838	87.03167761	84.43058334	81.91916479	79.49383635
221129A00034	11/29/2022	4.38	12/1/2025	11/29/2022	111.58911	108.5820875	105.673262	102.858892	100.1353987	97.49935896	94.94749803	92.47668179	90.08391014
211221A00023	12/21/2021	1.53	6/19/2026	12/21/2021	103.44507	100.0418187	96.76839273	93.61916492	90.58877927	87.6721397	84.864396	82.16093058	79.55734603
211222A00035	12/22/2021	2.15	12/22/2033	12/22/2021	113.40063	102.7673272	93.24019601	84.69779436	77.03259876	70.14934752	63.96358705	58.40039696	53.39327103
220106A00007	1/6/2022	2.42	1/6/2034	1/6/2022	116.30845	105.4872844	95.79090868	87.0957039	79.29224544	72.28361007	65.98389051	60.31689301	55.21499473
220302A00010	3/2/2022	2.14	1/13/2027	3/2/2022	106.82268	102.8075261	98.96605931	95.28984875	91.77091761	88.40171718	85.17510151	82.08430362	79.12291338
220324A00015	3/24/2022	2.79	3/3/2026	3/24/2022	106.99067	103.8150033	100.7506678	97.79310614	94.93797374	92.1811313	89.51863343	86.94671825	84.46179755
220630A00044	6/30/2022	3.34	6/30/2025	6/30/2022	106.56443	104.0587784	101.6255728	99.26229928	96.96654677	94.73600249	92.56844717	90.46175065	88.41386773
220802A00009	8/2/2022	3	8/2/2027	8/2/2022	111.92158	107.2535189	102.8096247	98.57791926	94.54713313	90.7066562	87.0464955	83.55723588	80.23000341
221206A00036	12/6/2022	4.13	12/6/2027	12/6/2022	118.3834	113.2200363	108.3186784	103.6646195	99.24405015	95.04400246	91.0522949	87.25748049	83.64879882
200306A00031	3/6/2020	1.01	3/6/2025	3/6/2020	100.47005	98.34434082	96.27353684	94.25582757	92.28948112	90.3728364	88.50429957	86.68234071	84.90549069
200316A00041	3/16/2020	1.16	3/16/2023	3/16/2020	100.0793	99.86943949	99.66047311	99.45239193	99.24519026	99.03886251	98.83340311	98.62880653	98.42506731
200423A00027	4/28/2020	0.88	4/15/2024	4/28/2020	99.679381	98.41575583	97.17831155	95.96623977	94.7787655	93.61514551	92.47466665	91.35664436	90.26042122
200428A00003	4/29/2020	1.01	4/29/2025	4/29/2020	100.5905	98.32206165	96.11550808	93.96882229	91.88006269	89.84736171	87.86892254	85.94301606	84.06797786
210609A00003	6/9/2021	0.47	6/9/2023	6/9/2021	99.792386	99.3509492	98.91341175	98.47972208	98.04982955	97.62368437	97.20123764	96.7824413	96.36724812
211123A00012	11/23/2021	2.27	11/23/2033	11/23/2021	114.66787	104.0366818	94.50216361	85.94482416	78.25877248	71.35010593	65.13549904	59.54096463	54.50076538
221207A00010	12/7/2022	4.08	12/7/2027	12/7/2022	118.14655	112.9861565	108.0878398	103.4368762	99.0194436	94.82256294	90.83404258	87.04242656	83.43694646
200309A00038	3/9/2020	1.26	3/11/2030	3/9/2020	104.1152	97.21764372	90.81909512	84.88096364	79.36783584	74.24719484	69.48916905	65.06630397	60.95335487
200326A00009	3/27/2020	1.54	3/27/2025	3/27/2020	101.71103	99.51525882	97.37729329	95.29518573	93.26707333	91.29117155	89.3657701	87.48922911	85.65997556
201021A00011	10/21/2020	1.11	10/21/2027	10/21/2020	103.37513	98.69696112	94.25534291	90.03714157	86.03001511	82.2223654	78.60328945	75.16253416	71.89045434
200228A00070	5/18/2020	1.35	5/18/2023	5/18/2020	100.17037	99.78782873	99.40820687	99.03147562	98.657602	98.2865535	97.91829811	97.55280433	97.1900411
210217A00009	2/18/2021	0.68	11/15/2024	2/18/2021	99.608786	97.78600133	96.00507329	94.26479857	92.56401639	90.90160648	89.27648736	87.68761475	86.13398007

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210219A00004	2/19/2021	0.91	2/19/2026	2/19/2021	100.98621	97.93877174	94.99809969	92.15984677	89.41986715	86.77420911	84.21910458	81.75095932	79.36634375
221129A00061	11/29/2022	4.39	11/27/2026	11/29/2022	115.33521	111.2795886	107.3924606	103.6659311	100.0925135	96.66510923	93.37698578	90.2217559	87.19335802
221216A00044	12/16/2022	4.43	4/16/2025	12/16/2022	108.43127	106.1047801	103.840369	101.6359848	99.48966208	97.3995139	95.36372775	93.38056214	91.44834327
200306A00077	3/6/2020	1.06	3/6/2025	3/6/2020	100.57948	98.45255546	96.38055761	94.36167859	92.39418582	90.47641754	88.60677926	86.78374045	85.00583137
220106A00011	1/6/2022	2.7	1/6/2038	1/6/2022	120.23756	105.8846169	93.47598444	82.73428918	73.42318756	65.3411079	58.31597428	52.20075358	46.86969393
221206A00039	12/6/2022	4.29	12/7/2026	12/6/2022	115.06309	110.9850116	107.0775372	103.3326189	99.74262739	96.30033144	92.99887545	89.83175774	86.79281043
200224A00006	2/24/2020	1.58	11/15/2024	2/24/2020	101.30605	99.46685402	97.66982401	95.91374791	94.19745663	92.51982186	90.8797544	89.27620253	87.70815051
211207A00011	12/7/2021	1.62	12/1/2026	12/7/2021	104.52462	100.6690925	96.97647297	93.43905524	90.04953503	86.80098928	83.68685423	80.70090491	77.83723585
220217A00013	2/17/2022	2.08	2/14/2025	2/17/2022	102.70026	100.6049556	98.5626187	96.57154321	94.63009541	92.73670651	90.88986948	89.08813609	87.33011416
221110A00076	11/10/2022	4.45	11/10/2026	11/10/2022	115.36279	111.3529474	107.5079066	103.8200218	100.2820444	96.88709741	93.62865487	90.50052168	87.49681534
200305A00015	3/5/2020	0.99	3/6/2023	3/5/2020	100.05006	99.86772473	99.68605861	99.50505909	99.32472248	99.14504513	98.9660234	98.7876537	98.60993244
200326A00016	3/26/2020	1.54	3/25/2025	3/26/2020	101.70331	99.51298616	97.3802072	95.3030449	93.27964842	91.30824446	89.38713333	87.51468515	85.68933633
200605A00005	6/5/2020	0.99	6/5/2025	6/5/2020	100.62759	98.26113054	95.96181454	93.72737067	91.55561436	89.44444759	87.39185494	85.39589981	83.45472085
210224A00006	2/26/2021	0.88	10/21/2025	2/26/2021	100.63214	97.90662587	95.26793842	92.71283293	90.23820877	87.84109884	85.51866292	83.26818147	81.08704967
200325A00016	3/30/2020	1.67	3/31/2025	3/30/2020	102.01953	99.80959125	97.65804433	95.56291601	93.52232134	91.53445463	89.59758534	87.71005422	85.87026971
201116A00024	11/18/2020	2.36	11/15/2034	11/18/2020	115.84008	104.3082809	94.05771045	84.93827188	76.8181854	69.58167177	63.12693778	57.36442396	52.21527945
201123A00009	11/25/2020	1.02	11/25/2024	11/25/2020	100.27026	98.41529532	96.60345103	94.8334676	93.10413458	91.41428431	89.76279015	88.14856475	86.57055843
210104A00009	12/20/2021	0.89	12/18/2026	12/20/2021	101.70829	97.8631756	94.18305252	90.66000689	87.28654586	84.05557282	80.96036435	77.99454858	75.15208496
211028A00013	10/28/2021	1.65	10/22/2027	10/28/2021	105.972	101.2294395	96.7259235	92.44820096	88.38381881	84.52107345	80.84896187	77.35713612	74.03586095
220727A00010	7/27/2022	3.38	7/24/2024	7/27/2022	103.73115	102.1723364	100.6446638	99.14726382	97.67930286	96.23997764	94.82851375	93.44416435	92.08620899
200330A00008	3/30/2020	1.09	3/28/2025	3/30/2020	100.70296	98.51603913	96.38680474	94.31331678	92.29371322	90.3262104	88.40909896	86.54074005	84.71956176
210616A00006	2/11/2022	0.86	2/11/2025	2/11/2022	100.08959	98.03095759	96.02435518	94.06811934	92.16064849	90.30040445	88.48590941	86.71574301	84.98853965
200529A00022	6/1/2020	0.98	6/1/2026	6/1/2020	101.48957	98.16607808	94.96802045	91.890024	88.92697477	86.07400356	83.32647293	80.67996485	78.1302692
201030A00016	10/30/2020	1.14	10/8/2027	10/30/2020	103.53966	98.89031059	94.47442056	90.27906146	86.29208821	82.50209003	78.89834187	75.47075932	72.20985674
201203A00005	12/3/2020	0.78	12/3/2026	12/3/2020	102.0596	98.22402637	94.5518661	91.0353377	87.66707258	84.44008874	81.34776849	78.38383746	75.54234504
210616A00012	3/18/2022	0.9	3/18/2025	3/18/2022	100.25461	98.09938891	96.0005016	93.95607002	91.96429413	90.02344867	88.13187937	86.28799936	84.49028578
210709A00006	7/13/2021	2.4	7/11/2031	7/13/2021	113.98824	105.5053082	97.72695895	90.59079192	84.04024241	78.02400436	72.4955168	67.41250288	62.73655572
211123A00010	11/23/2021	0.94	11/24/2023	11/23/2021	99.771024	98.88089727	98.00655886	97.14759213	96.30359475	95.47417832	94.65896776	93.85760076	93.06972724
221129A00043	11/29/2022	4.59	12/1/2025	11/29/2022	111.56245	108.5704328	105.6758201	102.8749088	100.1641585	97.5401826	94.9997407	92.53973125	90.15718491
200302A00013	3/2/2020	1.25	3/4/2024	3/2/2020	100.08026	98.92275224	97.79184147	96.68661873	95.60621723	94.54980876	93.51660159	92.50583845	91.51679474
200423A00006	4/23/2020	0.82	4/23/2025	4/23/2020	100.61789	98.35477303	96.15319633	94.01113376	91.9266388	89.89784095	87.92294222	86.00021384	84.12799311
210914A00018	9/14/2021	1.43	9/14/2029	9/14/2021	106.74867	100.1465579	93.99316629	88.25571515	82.90398879	77.91011772	73.24838451	68.89504669	64.82817516
220325A00012	3/28/2022	2.85	3/23/2026	3/28/2022	107.33925	104.1035006	100.9827759	97.97228858	95.06748661	92.26403686	89.55781268	86.94488264	84.42149979

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221011A00122	10/11/2022	4.64	12/11/2024	10/11/2022	107.3693	105.4015215	103.4801454	101.6037918	99.77113285	97.98088854	96.23182499	94.52275236	92.85252298
221024A00067	10/24/2022	4.92	10/24/2023	10/24/2022	103.08034	102.2573715	101.4475876	100.6506744	99.8663263	99.09424738	98.3341509	97.585759	96.84880237
221130A00032	11/30/2022	4.37	11/30/2027	11/30/2022	119.50405	114.3302829	109.417843	104.7521149	100.3193759	96.10673701	92.10208756	88.29404455	84.67190519
201030A00018	10/30/2020	1.15	10/22/2027	10/30/2020	103.56938	98.88395777	94.43551497	90.21089012	86.1977178	82.38437763	78.75994551	75.31414837	72.03732207
210330A00015	3/30/2021	0.47	3/30/2023	3/30/2021	99.904349	99.65635208	99.40957816	99.16401867	98.9196647	98.67650747	98.43453826	98.19374844	97.95412946
200401A00001	4/1/2020	1.01	4/1/2025	4/1/2020	100.53206	98.33659903	96.1993009	94.11820652	92.09143884	90.11719952	88.19376484	86.31948194	84.4927652
200527A00012	5/27/2020	1.2	5/27/2027	5/27/2020	103.47842	99.17627077	95.07582531	91.16662592	87.43881077	83.88307556	80.49063918	77.25321165	74.1629642
220311A00013	3/15/2022	2.35	3/15/2027	3/15/2022	108.0841	103.8764296	99.85669446	96.01546529	92.34383748	88.83340268	85.476218	82.26477728	79.19198448
200304A00032	3/4/2020	1.6	12/15/2028	3/4/2020	106.34299	100.5059547	95.02485065	89.87619066	85.03815214	80.49045053	76.21422349	72.19192436	68.40722413
200330A00043	3/30/2020	0.86	3/30/2023	3/30/2020	100.00174	99.75357666	99.50664199	99.26092234	99.01640884	98.77309267	98.53096513	98.29001758	98.05024147
210907A00006	9/7/2021	2.1	9/7/2034	9/7/2021	112.86968	101.6620105	91.68724672	82.80255743	74.88235641	67.81614047	61.50660917	55.8680272	50.82479719
220126A00003	1/26/2022	1.9	12/18/2026	1/26/2022	105.71448	101.7902447	98.03345513	94.43609734	90.99058692	87.68973995	84.52674967	81.49516472	78.58886863
220217A00015	2/17/2022	2.28	2/16/2027	2/17/2022	107.612	103.4884282	99.54637147	95.77685172	92.17139018	88.72197261	85.42102103	82.26136741	79.23622906
220721A00017	7/21/2022	3.51	1/22/2024	7/21/2022	102.49257	101.4313673	100.392157	99.37426305	98.37703393	97.3998444	96.44209424	95.50320699	94.5826288
221006A00095	10/6/2022	4.65	4/8/2024	10/6/2022	104.49818	103.2197871	101.9696875	100.7469366	99.55063468	98.37992162	97.23397457	96.11200594	95.01326154
200413A00026	4/13/2020	0.82	4/13/2023	4/13/2020	99.982404	99.69594816	99.41114199	99.1279712	98.84642165	98.56647937	98.28813056	98.01136157	97.73615891
210127A00009	1/27/2021	1.3	7/27/2029	1/27/2021	104.42102	98.07515057	92.15277751	86.62353733	81.45938896	76.63442733	72.12471024	67.90810009	63.96411921
210420A00009	4/20/2021	1.08	12/5/2025	4/20/2021	101.30592	98.45423277	95.69692375	93.03037689	90.45113087	87.9558756	85.54144473	83.20480855	80.94306735
220325A00018	3/28/2022	2.85	9/10/2026	3/28/2022	108.69271	104.9753614	101.4061924	97.97844774	94.68572408	91.52194753	88.48135434	85.55847304	82.74810771
220628A00044	8/15/2022	3.6	8/13/2027	8/15/2022	114.77249	110.0098151	105.4762066	101.1593819	97.04778929	93.13055617	89.39744512	85.83881328	82.44557447
220722A00044	9/1/2022	3.23	9/1/2027	9/1/2022	113.16763	108.3921559	103.8489288	99.52537025	95.40965804	91.49067196	87.75794821	84.2016368	80.81246205
221129A00039	11/29/2022	4.56	11/26/2025	11/29/2022	111.41514	108.4388334	105.5590249	102.7720614	100.0744496	97.46284709	94.93405504	92.48501117	90.11278319
210208A00015	2/10/2021	0.46	8/25/2023	2/10/2021	99.578166	98.93034585	98.29091012	97.65969728	97.03654961	96.42131342	95.81383887	95.21397991	94.62159413
210929A00011	3/16/2022	1.03	3/14/2025	3/16/2022	100.53354	98.38581451	96.2939951	94.25622231	92.2707176	90.33577594	88.44976209	86.61110708	84.8183049
220609A00035	8/30/2022	3.11	9/29/2023	8/30/2022	101.47712	100.7282351	99.99038868	99.26333915	98.54685088	97.84069498	97.14464918	96.45849751	95.78203012
220701A00050	7/1/2022	3.26	7/1/2027	7/1/2022	112.8393	108.2389052	103.8557319	99.67836496	95.69604589	91.89863518	88.27657319	84.82084394	81.52294138
220823A00002	8/23/2022	3.38	8/23/2027	8/23/2022	114.87989	110.056242	105.4665329	101.09813	96.93914914	92.9784106	89.20539286	85.61019028	82.18347351
221212A00011	12/12/2022	3.89	12/10/2027	12/12/2022	118.35891	113.1497579	108.2065194	103.5141805	99.05865661	94.82672595	90.80597256	86.98473301	83.35204698
200310A00041	3/10/2020	1.39	3/12/2029	3/10/2020	105.07348	99.04997981	93.40732863	88.11950898	83.16241627	78.51370562	74.15265426	70.06003531	66.21800218
200327A00022	3/27/2020	0.9	3/27/2023	3/27/2020	100.01445	99.77450103	99.53570019	99.29804129	99.06151618	98.82611678	98.5918351	98.35866322	98.12659329
200331A00008	3/31/2020	0.64	3/31/2023	3/31/2020	99.995794	99.74436741	99.49420358	99.24529261	98.99762511	98.75119176	98.50598338	98.26199084	98.01920512
210928A00007	9/28/2021	0.88	9/27/2024	9/28/2021	99.896127	98.19978039	96.53989963	94.9153738	93.32513773	91.7681694	90.24348771	88.75015042	87.28725214
221129A00047	11/29/2022	4.56	12/1/2025	11/29/2022	111.4747	108.4839711	105.5906176	102.7909348	100.0813832	97.45857733	94.91927759	92.46038332	90.07892605

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221129A00049	11/29/2022	4.56	12/1/2025	11/29/2022	111.4747	108.4839711	105.5906176	102.7909348	100.0813832	97.45857733	94.91927759	92.46038332	90.07892605
221208A00020	12/8/2022	4.11	12/8/2027	12/8/2022	118.30418	113.1371378	108.2325992	103.5758073	99.15291209	94.95090872	90.95758167	87.1614529	83.55173357
200826A00019	8/26/2020	0.98	8/26/2026	8/26/2020	101.73776	98.18709792	94.77801255	91.50408521	88.35922483	85.33765116	82.43387677	79.64269046	76.95914154
201015A00032	10/19/2020	2.33	10/19/2026	10/19/2020	107.0288	103.2380478	99.60254268	96.11510632	92.76893056	89.55755762	86.47486001	83.51502173	80.67252068
201215A00001	12/15/2020	0.76	12/15/2025	12/15/2020	100.38402	97.51966852	94.7510976	92.07459479	89.48661461	86.98376804	84.56281473	82.22065554	79.9543256
211206A00009	12/6/2021	1.43	12/5/2025	12/6/2021	102.33352	99.46665677	96.69454922	94.01356577	91.42023333	88.91123051	86.48338011	84.13364202	81.85910652
221102A00012	11/2/2022	4.82	11/3/2025	11/2/2022	111.88302	108.9620363	106.1338751	103.3950898	100.7423829	98.1725965	95.68270552	93.26981152	90.93113662
200310A00021	3/10/2020	1.1	3/10/2025	3/10/2020	100.67765	98.53896765	96.45572748	94.42609597	92.44831683	90.52070601	88.64164798	86.80959235	85.02305065
220715A00001	7/15/2022	3.44	7/15/2027	7/15/2022	113.77667	109.1163127	104.6772514	100.4477798	96.41687514	92.57415296	88.90982692	85.41467097	82.07998434
220915A00036	9/15/2022	4.23	9/16/2024	9/15/2022	105.62982	103.9113043	102.229101	100.5821251	98.96933234	97.38972006	95.84232493	94.32622114	92.84051847
220930A00049	9/30/2022	4.55	6/28/2024	9/30/2022	105.27023	103.7704549	102.2998365	100.8576012	99.44299896	98.05530568	96.69382202	95.3578724	94.04680397
200310A00062	3/10/2020	1.05	3/8/2024	3/10/2020	99.844013	98.67751326	97.53807237	96.42475807	95.33668054	94.27298993	93.23287415	92.21555684	91.22029535
200311A00050	3/2/2021	1.46	3/2/2026	3/2/2021	102.76268	99.65701183	96.66074849	93.7693986	90.97868526	88.28453361	85.68305987	83.17056102	80.74350512
200331A00024	3/31/2020	0.64	3/31/2023	3/31/2020	99.995794	99.74436741	99.49420358	99.24529261	98.99762511	98.75119177	98.50598338	98.26199084	98.01920512
200824A00020	8/26/2020	1.57	8/26/2025	8/26/2020	102.35678	99.75362981	97.22944525	94.78134176	92.4065588	90.10245551	87.86650458	85.69628649	83.58948406
220121A00013	1/21/2022	1.78	11/3/2025	1/21/2022	103.22279	100.4260162	97.71906483	95.09858747	92.56137966	90.10437277	87.72462752	85.41932783	83.18577499
220728A00070	7/28/2022	3.19	1/29/2024	7/28/2022	102.18918	101.1111152	100.0557878	99.02248261	98.01051547	97.0192302	96.04799733	95.09621269	94.16329617
220816A00009	8/16/2022	3.33	8/16/2027	8/16/2022	113.50229	108.7620671	104.2505014	99.9553067	95.86492873	91.96849371	88.25576437	84.71709912	81.34341399
220831A00078	8/31/2022	3.81	8/30/2024	8/31/2022	104.74401	103.0783962	101.4473218	99.84977325	98.28477906	96.75140516	95.24875325	93.77595904	92.33219063
220913A00018	9/13/2022	3.91	9/13/2027	9/13/2022	116.456	111.5719033	106.9257135	102.5045041	98.29612233	94.28914092	90.47281052	86.83701541	83.37223245
220919A00033	9/19/2022	4	9/17/2027	9/19/2022	116.96894	112.0604851	107.3914768	102.9488828	98.72045151	94.69466412	90.86068656	87.20832466	83.72798261
211026A00012	10/26/2021	1.52	10/26/2026	10/26/2021	103.9803	100.2286228	96.63195465	93.18310623	89.87526163	86.70195431	83.65704731	80.73471469	77.92942418
221110A00041	11/10/2022	4.85	5/10/2024	11/10/2022	105.15617	103.7886666	102.44559	101.126344	99.83034752	98.55703802	97.30587067	96.07631766	94.86786758
221118A00046	11/18/2022	4.4	11/18/2026	11/18/2022	115.26595	111.2361758	107.3728823	103.6683134	100.1151109	96.70629574	93.43524691	90.29568083	87.28163263
200331A00016	3/31/2020	1.11	3/31/2026	3/31/2020	102.42601	99.23172294	96.15274527	93.18422796	90.32155918	87.56035087	84.89642611	82.32580742	79.84470573
200826A00028	8/28/2020	1.08	8/28/2024	8/28/2020	100.16623	98.54536096	96.95814471	95.40359311	93.88076081	92.3887389	90.92665321	89.49366257	88.08895727
221214A00020	12/14/2022	4.2	12/12/2025	12/14/2022	110.54418	107.5367417	104.6283018	101.8150572	99.09337291	96.45977341	93.91093487	91.44367749	89.05495842
221221A00053	12/21/2022	4.15	12/21/2027	12/21/2022	118.57497	113.3665802	108.4244776	103.7335968	99.27980081	95.04982148	91.03120145	87.21224053	83.58194577
221216A00009	12/16/2022	4.27	12/16/2025	12/16/2022	110.79635	107.7741077	104.8516759	102.0252061	99.29102132	96.64560661	94.08560079	91.60778894	89.20909514
200327A00040	3/27/2020	0.72	3/27/2023	3/27/2020	100.01899	99.77852213	99.53921084	99.30104972	99.06403048	98.8281449	98.59338487	98.35974231	98.12720926
200417A00019	4/17/2020	0.77	4/17/2025	4/17/2020	100.48964	98.2436239	96.05831057	93.93168797	91.86182484	89.8468669	87.88503321	85.97461266	84.11396071
201218A00014	12/18/2020	0.57	12/18/2025	12/18/2020	100.4407	97.5531416	94.76270089	92.06559066	89.45819686	86.93706589	84.49889653	82.14053224	79.85895405
220317A00027	5/3/2022	2.59	5/3/2027	5/3/2022	109.43244	105.0654442	100.8986576	96.92188975	93.12551662	89.50044938	86.03810191	82.73036048	79.56955549

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220930A00046	9/30/2022	4.55	8/30/2024	9/30/2022	105.98378	104.3074535	102.6658568	101.057973	99.48282552	97.93947537	96.42701953	94.94458915	93.49134795
221213A00061	12/13/2022	4.15	12/11/2026	12/13/2022	114.55822	110.4788698	106.5707441	102.8257404	99.2361796	95.79478468	92.49465768	89.32925783	86.29238114
221207A00035	12/7/2022	4.31	1/7/2026	12/7/2022	111.16662	108.0784507	105.0940192	102.2092546	99.4202692	96.72334998	94.11494975	91.59167867	89.15029625
200218A00025	2/21/2020	1.71	2/24/2023	2/21/2020	100.1677	100.0127188	99.85822144	99.70420493	99.55066701	99.39760547	99.24501811	99.09290274	98.94125718
200312A00009	3/12/2020	1.46	3/12/2027	3/12/2020	104.33028	100.2090126	96.27246842	92.51136856	88.91695319	85.48095046	82.19554627	79.05335612	76.04739888
201221A00014	12/21/2020	0.76	12/19/2025	12/21/2020	100.39106	97.51610335	94.73762192	92.05186666	89.45525374	86.94435808	84.51590543	82.16676479	79.89394133
210225A00003	3/1/2021	0.93	9/24/2025	3/1/2021	100.71247	98.05698816	95.48410449	92.99072249	90.5738818	88.23075446	85.95863785	83.75494809	81.61721381
210302A00005	3/5/2021	0.92	9/10/2025	3/5/2021	100.65729	98.03845588	95.50018646	93.03949337	90.65352234	88.33954488	86.09495174	83.9172467	81.8040408
210826A00013	8/26/2021	1.97	2/28/2033	8/26/2021	111.3975	101.5657426	92.69190934	84.67737175	77.43413329	70.88363426	64.95569623	59.5875893	54.72320736
220804A00037	8/4/2022	3.35	8/4/2025	8/4/2022	106.90245	104.2966798	101.7682144	99.31429095	96.93226096	94.61958797	92.37384203	90.19269441	88.07391268
200312A00037	3/12/2020	1.3	3/12/2025	3/12/2020	101.12397	98.97494993	96.88172183	94.8424367	92.85532385	90.91868552	89.03089326	87.19038441	85.39565889
200730A00013	7/30/2020	0.74	1/30/2025	7/30/2020	99.810079	97.7875427	95.81556274	93.89254123	92.01694274	90.18729154	88.40216883	86.66021002	84.96010225
201028A00011	10/28/2020	0.91	4/28/2026	10/28/2020	101.15927	97.93072012	94.82098031	91.82508296	88.9382934	86.15609839	83.47419467	80.88847801	78.39503294
220203A00009	2/3/2022	1.99	2/2/2027	2/3/2022	106.32943	102.2712847	98.39066036	94.67884691	91.12760746	87.72915249	84.47611304	81.3615155	78.37875824
220420A00032	4/20/2022	3.26	10/16/2026	4/20/2022	110.53761	106.6886146	102.9962082	99.45316883	96.05264659	92.78814436	89.65349757	86.64285517	83.75066186
220516A00034	5/16/2022	2.72	11/16/2023	5/16/2022	101.35746	100.4808429	99.61937549	98.77266547	97.94033579	97.12202213	96.31737241	95.52604624	94.74771446
220722A00050	9/15/2022	3.25	9/15/2025	9/15/2022	106.99354	104.2750962	101.6399661	99.08505414	96.60740707	94.20420217	91.8727404	89.61044	87.41483043
200306A00028	3/6/2020	1.01	3/6/2025	3/6/2020	100.47005	98.34434082	96.27353684	94.25582757	92.28948112	90.3728364	88.50429957	86.68234071	84.90549069
200916A00016	9/16/2020	0.6	9/16/2024	9/16/2020	99.379677	97.71661646	96.08886664	94.495367	92.93510011	91.40708907	89.91039546	88.4441174	87.00738774
220817A00036	10/14/2022	3.41	10/15/2027	10/14/2022	114.37113	109.4482322	104.7697353	100.3221877	96.09294756	92.07013229	88.24256916	84.5997489	81.13178271
221129A00070	11/29/2022	4.28	11/26/2027	11/29/2022	119.02135	113.8702334	108.9789357	104.3329484	99.91864941	95.72324272	91.73470369	87.94172882	84.33368893
221205A00065	12/5/2022	4.13	12/6/2027	12/5/2022	118.3834	113.2200363	108.3186784	103.6646195	99.24405015	95.04400246	91.0522949	87.25748049	83.64879882
200504A00007	5/4/2020	1.47	5/4/2028	5/4/2020	105.49575	100.2578546	95.31002114	90.63476566	86.21574145	82.03765997	78.08621737	74.3480264	70.81055338
220408A00013	4/8/2022	3.15	1/14/2027	4/8/2022	110.90919	106.8092556	102.8857948	99.13025937	95.53456162	92.09104743	88.79247068	85.63196914	82.60304203
200316A00048	3/16/2020	1.11	3/16/2023	3/16/2020	100.06875	99.85891028	99.64995973	99.44189432	99.23470838	99.0283963	98.82295252	98.61837151	98.41464781
200430A00030	4/30/2020	0.96	4/30/2025	4/30/2020	100.47565	98.2059928	95.99832698	93.85063296	91.76096751	89.72746122	87.74831529	85.82179843	83.94624401
220502A00030	5/4/2022	3.24	6/20/2025	5/4/2022	106.23266	103.757506	101.353214	99.01735135	96.7475826	94.5416665	92.39745143	90.31287124	88.28594137
220726A00032	7/26/2022	3.36	7/26/2023	7/26/2022	101.335	100.7617232	100.1949333	99.63451642	99.08036562	98.53237617	97.9904457	97.4544741	96.92436345
221117A00025	11/17/2022	4.28	11/17/2027	11/17/2022	118.93005	113.8057518	108.9387685	104.3147993	99.92040921	95.74297402	91.77062731	87.99221112	84.3972302
221129A00042	11/29/2022	4.56	11/28/2025	11/29/2022	111.43886	108.4568238	105.5716292	102.7796061	100.077243	97.46118061	94.92820401	92.47523582	90.09932948
221207A00017	12/7/2022	3.86	12/7/2027	12/7/2022	118.18093	112.9846427	108.0532461	103.3718099	98.92632294	94.7036311	90.69138071	86.87796565	83.25247844
210826A00008	8/26/2021	0.89	2/26/2025	8/26/2021	100.19002	98.08891064	96.04165801	94.04651	92.10178188	90.20585705	88.35718367	86.55427146	84.79568874
220209A00011	2/9/2022	2.14	1/11/2027	2/9/2022	106.81078	102.8011201	98.96473245	95.29321507	91.77861796	88.41341728	85.19049017	82.10309109	79.1448298

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221212A00052	12/12/2022	4.97	6/12/2024	12/12/2022	105.70822	104.2474453	102.8143019	101.4080748	100.0280705	98.67361918	97.34407309	96.03880608	94.75721248
220314A00008	3/14/2022	2.38	7/28/2025	3/14/2022	104.33715	101.7836351	99.30570929	96.90067984	94.56596866	92.29910604	90.09772528	87.95955761	85.8824275
221129A00066	11/29/2022	4.28	11/29/2027	11/29/2022	119.05177	113.8917291	108.9923358	104.3390203	99.91809796	95.71671508	91.72279403	87.9249826	84.31260675
221129A00069	11/29/2022	4.28	11/26/2027	11/29/2022	119.02135	113.8702334	108.9789357	104.3329484	99.91864941	95.72324272	91.73470369	87.94172882	84.33368893
221130A00041	11/30/2022	4.95	12/2/2024	11/30/2022	107.85908	105.911222	104.0087197	102.1502406	100.3345022	98.56026766	96.82634431	95.1315814	93.47486846
221216A00047	12/16/2022	4.34	6/16/2025	12/16/2022	108.91383	106.4157108	103.9885948	101.6300583	99.33777343	97.10950568	94.9431094	92.83652384	90.78776917
210624A00003	6/24/2021	0.78	6/24/2024	6/24/2021	99.600163	98.15494344	96.73772319	95.3477615	93.98434305	92.64677705	91.33439615	90.04655546	88.78263165
210916A00003	9/16/2021	0.75	9/16/2024	9/16/2021	99.637947	97.9725953	96.34259533	94.74688593	93.18444855	91.65430523	90.15551651	88.68717954	87.2484262
220301A00014	3/1/2022	1.85	1/10/2025	3/1/2022	102.04476	100.0506587	98.10547219	96.2076935	94.35586856	92.54859833	90.78453626	89.06238591	87.3808987
221104A00044	11/4/2022	5.11	11/15/2023	11/4/2022	103.46706	102.5829843	101.7140848	100.8599748	100.0202783	99.19463163	98.38268362	97.58409456	96.79853597
221220A00017	12/20/2022	4.99	12/20/2023	12/20/2022	103.731	102.7512691	101.7901359	100.8470709	99.92156725	99.01313655	98.12130856	97.24563015	96.38566457
200319A00025	3/19/2020	1.39	3/21/2024	3/19/2020	100.27822	99.07470163	97.89988765	96.75276534	95.63236511	94.53776215	93.46807391	92.42245764	91.40010825
210225A00016	3/1/2021	0.88	7/15/2025	3/1/2021	100.43554	97.96756439	95.572289	93.24714973	90.98968865	88.79754981	86.66847422	84.60029525	82.59093419
211220A00006	12/20/2021	1.21	12/20/2024	12/20/2021	100.68287	98.75810256	96.87957733	95.04590271	93.2557373	91.50778891	89.80081243	88.13360773	86.50501775
221014A00027	10/14/2022	4.63	10/14/2027	10/14/2022	120.25086	115.1899201	110.3782614	105.8022123	101.4489272	97.30633073	93.36306721	89.60845388	86.03243734
221021A00022	10/21/2022	4.84	10/21/2024	10/21/2022	107.13958	105.3116533	103.5240748	101.775683	100.0653592	98.39202488	96.75464047	95.15220312	93.58374529
200521A00015	5/21/2020	2.14	5/21/2036	5/21/2020	112.93475	100.3387735	89.30399277	79.62730411	71.13301582	63.66902498	57.10354619	51.32230778	46.22614655
220331A00004	3/31/2022	2.66	5/20/2024	3/31/2022	102.20257	100.8293893	99.48119379	98.15736246	96.85729206	95.58039885	94.32611779	93.09390173	91.88322081
200310A00051	3/10/2020	1.41	3/8/2030	3/10/2020	105.18448	98.25696898	91.82931384	85.86293629	80.32242161	75.17524731	70.39153257	65.94381076	61.80682257
200327A00031	3/27/2020	1.18	3/27/2025	3/27/2020	100.90247	98.71593479	96.58700748	94.5137528	92.49431333	90.52690973	88.60983669	86.74145915	84.92020872
200417A00002	4/17/2020	0.96	4/17/2025	4/17/2020	100.45029	98.21446397	96.03888696	93.92156868	91.86059716	89.85413639	87.90042277	85.99776165	84.14452414
200511A00006	5/11/2020	1.65	5/13/2030	5/11/2020	106.98316	99.82881221	93.20101132	87.05837641	81.36297242	76.08000728	71.17755715	66.62631696	62.39937373
220617A00027	6/17/2022	3.45	6/17/2024	6/17/2022	103.52932	102.0719786	100.642475	99.24008037	97.86409101	96.513827	95.18863131	93.88786884	92.61092547
220701A00049	7/1/2022	3.19	7/1/2025	7/1/2022	106.19721	103.6934662	101.2621985	98.90088956	96.60712484	94.37858831	92.21305769	90.10840004	88.06256761
200413A00011	4/13/2020	0.94	4/12/2024	4/13/2020	99.75103	98.49450514	97.26483765	96.06116816	94.8826741	93.72856772	92.59809421	91.49053002	90.4051812
200415A00026	4/15/2020	0.77	4/14/2023	4/15/2020	99.967175	99.67801178	99.39052972	99.10471401	98.82055012	98.53802369	98.25712051	97.97782657	97.700128
220315A00014	3/15/2022	2.78	3/15/2032	3/15/2022	118.27014	108.9788041	100.5083477	92.78147139	85.72854284	79.28680243	73.39965188	68.01601965	63.08979482
200327A00061	3/31/2020	1.18	3/31/2025	3/31/2020	100.91365	98.71639279	96.57726341	94.49429722	92.46561674	90.48942344	88.56399366	86.68767479	84.85888166
200415A00038	4/15/2020	1.37	4/15/2027	4/15/2020	104.07808	99.87298156	95.86010558	92.02967449	88.37245749	84.87974032	81.54329345	78.35534236	75.3085399
200428A00002	4/28/2020	1.47	4/26/2030	4/28/2020	107.27297	100.0812342	93.41798447	87.241772	81.51459449	76.20159241	71.27077464	66.69276927	62.44059722
210526A00014	5/26/2021	1.01	12/19/2025	5/26/2021	101.1346	98.24852458	95.45920315	92.76287549	90.155949	87.63499022	85.1967168	82.83799	80.55580756
200310A00020	3/10/2020	1.1	3/10/2025	3/10/2020	100.67765	98.53896765	96.45572748	94.42609597	92.44831683	90.52070601	88.64164798	86.80959235	85.02305065
220329A00007	3/29/2022	2.94	3/29/2029	3/29/2022	114.71143	108.3497706	102.3875443	96.79747842	91.55430717	86.63461375	82.01668515	77.68037904	73.60700184

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220729A00045	7/29/2022	3.03	7/29/2027	7/29/2022	112.02867	107.3689713	102.9325671	98.70755462	94.68272887	90.84753916	87.19204714	83.70688796	80.38323398
200527A00015	5/27/2020	0.99	11/26/2025	5/27/2020	101.02123	98.19715735	95.46584845	92.8237743	90.2675585	87.79397084	85.39992024	83.08244792	80.83872098
210714A00020	7/14/2021	0.9	3/14/2025	7/14/2021	100.24617	98.10168059	96.01302614	93.97835401	91.99588752	90.06392343	88.18082823	86.34503458	84.55503811
220121A00014	1/21/2022	1.78	11/3/2025	1/21/2022	103.22279	100.4260162	97.71906483	95.09858747	92.56137966	90.10437277	87.72462752	85.41932783	83.18577499
221027A00004	10/27/2022	4.76	10/28/2024	10/27/2022	107.08207	105.2353128	103.4297054	101.6640833	99.93732395	98.24834356	96.59609563	94.97956937	93.39778821
200327A00066	6/25/2020	0.93	6/26/2023	6/25/2020	99.976393	99.48848091	99.00531456	98.52682496	98.0529445	97.58360687	97.11874703	96.65830117	96.20220669
211123A00011	11/23/2021	1.69	11/23/2026	11/23/2021	104.76165	100.9222445	97.24419105	93.7198902	90.34214357	87.10412651	83.99936668	81.02172405	78.16537215
220915A00035	9/15/2022	4.2	3/17/2025	9/15/2022	107.57417	105.3390163	103.1617662	101.0405007	98.973378	96.95863237	94.99457059	93.07956816	91.21206588
221129A00085	11/29/2022	4.38	11/30/2026	11/29/2022	115.33207	111.2683431	107.3737735	103.6404142	100.0607357	96.62760012	93.33423805	90.17422797	87.14147639
200302A00003	3/2/2020	1.2	3/2/2023	3/2/2020	100.08885	99.91746277	99.74666043	99.57644154	99.40680312	99.23774224	99.06925595	98.90134136	98.73399556
210104A00012	12/20/2021	0.89	12/18/2026	12/20/2021	101.70829	97.8631756	94.18305252	90.66000689	87.28654586	84.05557282	80.96036435	77.99454858	75.15208496
210305A00005	3/9/2021	0.54	8/11/2023	3/9/2021	99.665339	99.05469181	98.45149873	97.85562352	97.2669336	96.68529955	96.11059505	95.54269681	94.98148442
220217A00020	2/17/2022	2.08	2/13/2025	2/17/2022	102.69456	100.6021192	98.56251567	96.57405757	94.6351167	92.74412948	90.8995938	89.1000661	87.34415858
220331A00003	3/31/2022	2.66	5/17/2024	3/31/2022	102.18488	100.8199328	99.47969601	98.16355292	96.87091005	95.60119296	94.35384547	93.128329	91.92412181
221031A00033	10/31/2022	4.74	10/31/2025	10/31/2022	111.61806	108.7089984	105.8921664	103.1641528	100.5216885	97.96164264	95.48101571	93.07693335	90.74664048
221212A00071	12/12/2022	4.15	12/13/2027	12/12/2022	118.55048	113.3634142	108.4404815	103.7668002	99.32840135	95.11217056	91.10579168	87.29769398	83.67700329
201030A00017	10/30/2020	1.14	10/15/2027	10/30/2020	103.5065	98.8409992	94.41061968	90.20231839	86.2038462	82.40369318	78.79104007	75.35571304	72.08814182
221228A00044	12/28/2022	4.31	12/28/2027	12/28/2022	119.44127	114.1919389	109.2116873	104.485237	99.99826143	95.73731744	91.68978635	87.84381893	84.18828467
200304A00012	3/4/2020	0.98	3/4/2025	3/4/2020	100.85243	98.71883295	96.64037106	94.61523039	92.64167143	90.71802581	88.84269267	87.01413538	85.23087834
200402A00036	4/2/2020	0.71	4/2/2024	4/2/2020	99.673245	98.43890643	97.23380064	96.05689549	94.90720696	93.78379642	92.68576807	91.6122665	90.56247443
210616A00009	2/11/2022	0.86	2/11/2025	2/11/2022	100.08959	98.03095759	96.02435518	94.06811934	92.16064849	90.30040445	88.48590941	86.71574301	84.98853965
210624A00004	6/24/2021	1.01	6/24/2025	6/24/2021	100.71515	98.29896904	95.95271811	93.67397398	91.46041702	89.30982155	87.22005139	85.18905572	83.21486507
220301A00013	3/1/2022	2.01	2/16/2027	3/1/2022	106.49685	102.3961841	98.47629641	94.72824265	91.14357212	87.71429735	84.43286585	81.29213392	78.28534206
220325A00017	3/28/2022	2.86	3/23/2027	3/28/2022	110.29173	106.016028	101.9315945	98.02879846	94.29855194	90.73227544	87.32186632	84.05966924	80.93844871
220613A00030	6/13/2022	3.08	6/13/2023	6/13/2022	100.97356	100.5181328	100.0668204	99.61956672	99.1763171	98.73701778	98.30161602	97.87005997	97.44229871
200302A00060	3/2/2021	1.44	3/3/2025	3/2/2021	101.40042	99.27238495	97.19909138	95.17874689	93.20963091	91.29009289	89.4185488	87.59347789	85.81341957
201015A00025	10/19/2020	1.54	10/18/2027	10/19/2020	105.4306	100.7115365	96.23002023	91.97288083	87.92775051	84.0830068	80.42772363	76.95162591	73.64504738
210330A00024	3/30/2021	0.68	3/29/2024	3/30/2021	99.397112	98.17844117	96.98937554	95.82884834	94.69584342	93.58939229	92.50857141	91.4524996	90.42033561
210917A00012	9/17/2021	1.2	9/11/2026	9/17/2021	102.59682	98.98935754	95.5269701	92.20301394	89.01119169	85.94553088	83.00036501	80.17031584	77.45027687
220422A00014	4/22/2022	3.36	9/29/2026	4/22/2022	110.75472	106.9485592	103.295462	99.78838017	96.42063338	93.1858894	90.07814334	87.09169851	84.22114855
200330A00007	3/30/2020	0.93	4/1/2024	3/30/2020	99.714892	98.48644848	97.2873202	96.11646557	94.97289171	93.85565182	92.76384246	91.69660121	90.65310424
211214A00015	12/14/2021	1.49	12/12/2025	12/14/2021	102.53594	99.64749186	96.85509685	94.15504574	91.5437966	89.01796326	86.57430756	84.20973201	81.92127283
220324A00007	3/24/2022	2.72	3/24/2025	3/24/2022	104.34005	102.1224076	99.96280394	97.85929842	95.81002865	93.81321016	91.86713232	89.97015467	88.1207033

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210121A00014	1/22/2021	0.64	10/25/2024	1/22/2021	99.510998	97.74362208	96.01572521	94.32618262	92.67390899	91.05785723	89.47701677	87.93041207	86.41710113
211206A00017	12/6/2021	1.56	12/4/2026	12/6/2021	104.3029	100.4437301	96.74800235	93.207969	89.81628646	86.56599522	83.45049781	80.46353799	77.5991814
220808A00025	8/8/2022	3.25	8/6/2027	8/8/2022	113.10036	108.3947531	103.915195	99.64959744	95.58658414	91.71544569	88.02609651	84.50903509	81.15530695
221206A00025	12/6/2022	4.27	12/4/2026	12/6/2022	114.9487	110.8812563	106.9836585	103.247907	99.66642044	96.2320125	92.93786932	89.77752806	86.74485705
200316A00071	3/16/2020	1.18	3/16/2023	3/16/2020	100.08351	99.87365118	99.66467847	99.45659097	99.24938302	99.043049	98.83758335	98.63298054	98.42923512
210907A00007	9/7/2021	2.35	9/4/2037	9/7/2021	115.34933	101.5941372	89.67847129	79.34402685	70.37007879	62.56784444	55.77571612	49.85522565	44.68762551
200414A00015	4/14/2020	0.64	4/14/2023	4/14/2020	99.986913	99.6970833	99.40894625	99.12248661	98.83768963	98.55454076	98.27302561	97.99312994	97.71483969
210122A00005	1/26/2021	0.6	7/15/2024	1/26/2021	99.346089	97.84718002	96.37803703	94.93784453	93.52581614	92.14119356	90.78324527	89.45126539	88.1445725
220124A00007	1/24/2022	1.88	1/22/2027	1/24/2022	105.82012	101.8015848	97.95794024	94.28064791	90.76163515	87.39326504	84.16831041	81.07992946	78.12164314
220125A00008	1/25/2022	1.31	1/26/2024	1/25/2022	100.13824	99.07996208	98.04391523	97.02940816	96.03577504	95.0623772	94.1086018	93.17386051	92.25758831
220506A00016	5/6/2022	3.35	5/6/2027	5/6/2022	112.75591	108.3090503	104.0655219	100.0149766	96.1476447	92.45429992	88.92622664	85.55518905	82.33340228
220920A00024	9/20/2022	4.25	9/19/2025	9/20/2022	109.75296	106.9859883	104.3038097	101.7032677	99.18135112	96.73518259	94.36201113	92.05920562	89.82424865
221110A00023	11/10/2022	4.71	11/8/2024	11/10/2022	107.12402	105.2472647	103.4129291	101.6198042	99.86672477	98.15256608	96.47624193	94.83670325	93.23293652
221212A00040	12/12/2022	4.45	12/12/2025	12/12/2022	111.28295	108.2645323	105.3453872	102.5217004	99.78982829	97.14628727	94.58774551	92.11101563	89.7130475
200331A00014	3/31/2020	0.72	3/29/2024	3/31/2020	99.679905	98.45576906	97.26141765	96.0957763	94.95782124	93.8465768	92.76111265	91.7005412	90.66401513
200218A00030	2/21/2020	1.71	2/24/2023	2/21/2020	100.1677	100.0127188	99.85822144	99.70420493	99.55066701	99.39760547	99.24501811	99.09290274	98.94125718
200225A00023	2/25/2020	1.62	2/25/2025	2/25/2020	101.76738	99.65164223	97.5899998	95.5806884	93.62201911	91.71237113	89.85018848	88.03397681	86.26230044
200305A00045	3/5/2020	0.99	3/6/2023	3/5/2020	100.05006	99.86772473	99.68605861	99.50505909	99.32472248	99.14504513	98.9660234	98.7876537	98.60993244
200310A00028	3/10/2020	1.1	3/10/2025	3/10/2020	100.67765	98.53896765	96.45572748	94.42609597	92.44831683	90.52070601	88.64164798	86.80959235	85.02305065
210218A00010	2/18/2021	1.72	2/18/2031	2/18/2021	107.99676	100.1111158	92.85862707	86.18518397	80.04156218	74.38295907	69.16857546	64.36123895	59.92706451
211015A00031	10/15/2021	1.22	10/15/2025	10/15/2021	101.57013	98.84732873	96.2106932	93.65700173	91.18317185	88.78625547	86.46343201	84.21200207	82.0293813
220817A00038	10/14/2022	3.41	10/15/2027	10/14/2022	114.37113	109.4482322	104.7697353	100.3221877	96.09294756	92.07013229	88.24256916	84.5997489	81.13178271
200304A00033	3/4/2020	1.17	3/4/2025	3/4/2020	100.81454	98.69033435	96.62086322	94.6043293	92.63900998	90.72325287	88.85547229	87.03414599	85.25781202
220126A00002	1/26/2022	1.9	12/18/2026	1/26/2022	105.71448	101.7902447	98.03345513	94.43609734	90.99058692	87.68973995	84.52674967	81.49516472	78.58886863
220331A00012	3/31/2022	2.81	3/17/2025	3/31/2022	104.4902	102.2898387	100.1466734	98.05879877	96.02439305	94.04170993	92.10907477	90.22488098	88.38758663
220511A00015	5/11/2022	3.29	5/11/2027	5/11/2022	112.53932	108.0833238	103.8317388	99.77412607	95.90063589	92.20196817	88.66933908	85.29444979	82.06945727
221107A00010	11/7/2022	5.12	11/7/2024	11/7/2022	107.87615	105.9948805	104.1560457	102.3584425	100.6009069	98.88231479	97.20158095	95.55765701	93.94953017
221129A00038	11/29/2022	4.56	11/26/2025	11/29/2022	111.41514	108.4388334	105.5590249	102.7720614	100.0744496	97.46284709	94.93405504	92.48501117	90.11278319
200403A00017	4/3/2020	0.81	4/3/2023	4/3/2020	99.986468	99.72737868	99.4696321	99.21321771	98.95812523	98.70434443	98.45186521	98.20067759	97.95077166
210226A00004	3/1/2021	1.04	12/5/2025	3/1/2021	101.18848	98.33852717	95.58290941	92.91801244	90.3403763	87.84669218	85.43379497	83.09865616	80.83837716
221118A00018	11/18/2022	4.55	11/18/2025	11/18/2022	111.29136	108.3384011	105.480557	102.7142475	100.0360511	97.4426934	94.93103941	92.49808721	90.14096137
200316A00049	3/16/2020	1.25	3/14/2025	3/16/2020	101.01985	98.86665652	96.76948104	94.72646097	92.73581465	90.79583403	88.90488094	87.0613836	85.26383332
210121A00012	1/22/2021	0.64	10/15/2024	1/22/2021	99.49798	97.75742281	96.05521867	94.39024409	92.76141841	91.16770142	89.60809144	88.08162354	86.58736788

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220222A00018	2/22/2022	2.5	12/19/2031	2/22/2022	115.42403	106.4777651	98.30700386	90.84017596	84.01266547	77.76610318	72.04773373	66.80984982	62.00928591
220224A00023	2/24/2022	2.15	3/16/2026	2/24/2022	105.03604	101.8564415	98.78964638	95.83097733	92.97598619	90.22043739	87.5602963	84.99171813	82.51103772
220225A00015	2/25/2022	2.26	2/25/2027	2/25/2022	107.59054	103.4421693	99.47733535	95.68692147	92.0623127	88.59536867	85.27839467	82.1041145	79.06564528
220428A00019	4/28/2022	3.27	4/28/2027	4/28/2022	112.33834	107.9224094	103.7075673	99.68361412	95.84092112	92.17039386	88.66343985	85.31193823	82.10821161
220812A00001	8/12/2022	3.17	8/12/2027	8/12/2022	113.80644	109.0375381	104.4990273	100.1785145	96.06434547	92.14555322	88.41181313	84.85340185	81.46115895
200225A00029	2/25/2020	1.89	12/28/2029	2/25/2020	108.47019	101.6069114	95.22502302	89.28829277	83.76338949	78.61963823	73.82879594	69.36484722	65.20381819
200407A00019	4/7/2020	1.06	4/8/2024	4/7/2020	99.896304	98.64892187	97.42930705	96.2365324	95.06971235	93.92800023	92.81058616	91.71669504	90.6455847
200629A00020	6/29/2020	1.4	6/28/2030	6/29/2020	105.18508	97.98362088	91.32197867	85.1570014	79.44919099	74.16237647	69.26341834	64.72194043	60.51008684
221202A00025	12/2/2022	4.06	12/2/2026	12/2/2022	114.97755	110.8914006	106.9762346	103.2239855	99.62700956	96.17806197	92.87027386	89.6971308	86.65245263
200108A00016	12/18/2020	1.98	12/18/2023	12/18/2020	100.77548	99.81662391	98.87595553	97.95296083	97.0471452	96.15803234	95.28516342	94.42809627	93.58640466
200312A00015	3/12/2020	1.23	3/10/2025	3/12/2020	100.96359	98.82171363	96.73533895	94.70263643	92.72184795	90.7912877	88.90933844	87.07444816	85.2851268
200916A00015	9/16/2020	0.72	9/16/2025	9/16/2020	100.12562	97.49869145	94.95301845	92.48557174	90.09345725	87.77390929	85.52428379	83.34205194	81.22479427
220617A00026	6/17/2022	3.36	12/18/2023	6/17/2022	102.12097	101.155058	100.207428	99.27756328	98.36496716	97.46916142	96.58968533	95.7260949	94.87796212
220826A00015	8/26/2022	3.64	8/25/2023	8/26/2022	101.67305	101.0175006	100.3704036	99.73159954	99.10092957	98.47823898	97.86337692	97.25619633	96.65655381
221118A00045	11/18/2022	4.57	11/18/2025	11/18/2022	111.34915	108.3953536	105.5366896	102.76958	100.0906027	97.49648263	94.98408426	92.5504051	90.19256918
210721A00009	7/21/2021	1.7	7/21/2031	7/21/2021	108.11367	99.84797675	92.27656886	85.33753273	78.97476766	73.13741648	67.77935124	62.85871157	58.33749032
220106A00009	1/6/2022	2.57	1/4/2036	1/6/2022	118.44493	105.812235	94.69488567	84.90124197	76.26487007	68.64111281	61.90414089	55.94441605	50.66650713
220630A00057	6/30/2022	3.34	6/30/2025	6/30/2022	106.56443	104.0587784	101.6255728	99.26229928	96.96654677	94.73600249	92.56844717	90.46175065	88.41386773
200316A00050	3/16/2020	1.54	3/16/2027	3/16/2020	104.68337	100.5440707	96.59063453	92.81370079	89.20443898	85.75451167	82.45604392	79.30159473	76.28413048
200324A00012	3/25/2020	1.78	3/25/2025	3/25/2020	102.24104	100.0445876	97.90581125	95.82277434	93.79362247	91.81657892	89.8899407	88.01207474	86.18141439
200417A00014	4/17/2020	0.96	4/17/2025	4/17/2020	100.45029	98.21446397	96.03888696	93.92156868	91.86059716	89.85413639	87.90042277	85.99776165	84.14452414
200504A00006	5/4/2020	0.94	5/5/2025	5/4/2020	100.43984	98.15733202	95.93751214	93.77832174	91.67778546	89.63400345	87.64514804	85.70946056	83.8252484
210907A00014	9/9/2021	2.45	9/9/2026	9/9/2021	107.20727	103.5199508	99.9798152	96.58014919	93.31459056	90.1771042	87.16196317	84.2637309	81.47724458
220527A00011	5/27/2022	2.75	5/24/2024	5/27/2022	102.3668	100.9813716	99.62133662	98.28605251	96.97490228	95.68728901	94.42263503	93.18038112	91.95998583
210826A00009	8/26/2021	1.18	8/26/2026	8/26/2021	102.46889	98.90488548	95.48284558	92.19633691	89.03925466	86.00580538	83.09048908	80.28808251	77.59362346
210920A00015	9/9/2022	1.28	9/9/2026	9/9/2022	102.8855	99.27784825	95.81504687	92.49046932	89.29783679	86.23119391	83.28488996	80.4535612	77.73211452
200225A00035	10/5/2020	1.5	10/5/2023	10/5/2020	100.26325	99.50342281	98.75506539	98.01792014	97.29173661	96.57627174	95.87128961	95.17656121	94.49186411
200324A00066	3/26/2020	1.81	3/26/2025	3/26/2020	102.31285	100.1128948	97.97075953	95.88450012	93.85225567	91.87224342	89.94275463	88.06215085	86.22886031
200330A00017	3/30/2020	0.86	3/30/2023	3/30/2020	100.00174	99.75357666	99.50664199	99.26092234	99.01640884	98.77309267	98.53096513	98.29001758	98.05024147
200826A00029	8/28/2020	1.16	11/27/2024	8/28/2020	100.52408	98.66181713	96.84293629	95.06616841	93.3302929	91.63413241	89.97655109	88.3564528	86.77277946
210104A00010	11/22/2021	0.88	11/20/2026	11/22/2021	101.59667	97.82636629	94.21490575	90.75481013	87.43899128	84.26072866	81.21364846	78.29170383	75.48915652
211026A00013	10/26/2021	1.52	10/26/2026	10/26/2021	103.9803	100.2286228	96.63195465	93.18310623	89.87526163	86.70195431	83.65704731	80.73471469	77.92942418
221129A00077	11/29/2022	4.38	12/1/2026	11/29/2022	115.34425	111.2774871	107.3801117	103.6441676	100.0621104	96.62678749	93.33141632	90.16956294	87.13512234

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221202A00013	12/2/2022	4.78	12/3/2024	12/2/2022	107.54314	105.5956484	103.6935813	101.8356002	100.0204186	98.24679646	96.51353773	94.81948852	93.16353542
200318A00038	3/18/2020	1.48	3/18/2025	3/18/2020	101.54303	99.37325569	97.26011203	95.20171455	93.19625479	91.2419994	89.33728631	87.48052116	85.67017385
211129A00011	11/29/2021	1.53	11/20/2026	11/29/2021	104.12527	100.3059638	96.64699138	93.14082056	89.78030804	86.55868064	83.46951429	80.50671417	77.6644962
220106A00013	1/6/2022	2.75	1/6/2039	1/6/2022	120.74635	105.5969531	92.61436703	81.47228953	71.89530683	63.65072518	56.54174623	50.40176178	45.08957977
220323A00017	6/2/2022	2.78	6/2/2025	6/2/2022	104.96916	102.5569594	100.2126359	97.93390057	95.71855614	93.56449204	91.46968047	89.4321726	87.45009503
221129A00065	11/29/2022	4.28	11/30/2027	11/29/2022	119.06191	113.8988881	108.996794	104.3410337	99.91790162	95.71452486	91.71880811	87.91938287	84.30556015
200226A00004	2/26/2020	1.58	2/26/2025	2/26/2020	101.68514	99.56753355	97.50412328	95.49314228	93.53289651	91.62176042	89.75817352	87.94063722	86.16771183
200304A00018	3/4/2020	0.98	3/4/2025	3/4/2020	100.85243	98.71883295	96.64037106	94.61523039	92.64167143	90.71802581	88.84269267	87.01413538	85.23087834
200327A00041	3/27/2020	0.9	3/27/2023	3/27/2020	100.01445	99.77450103	99.53570019	99.29804129	99.06151618	98.82611678	98.5918351	98.35866322	98.12659329
200928A00009	9/28/2020	1.51	9/28/2032	9/28/2020	106.84119	97.59191056	89.2162234	81.62706092	74.74644995	68.50451799	62.83861398	57.69252852	53.01580197
220315A00015	3/15/2022	3.18	3/13/2037	3/15/2022	126.72447	112.5806378	100.2466635	89.47752077	80.06268787	71.82112672	64.59701279	58.25610269	52.68264106
220819A00034	8/19/2022	3.73	8/19/2032	8/19/2022	127.85805	117.7287801	108.5198888	100.1418939	92.51447994	85.56551632	79.23018391	73.45019821	68.17311901
221129A00078	11/29/2022	4.38	12/1/2026	11/29/2022	115.34425	111.2774871	107.3801117	103.6441676	100.0621104	96.62678749	93.33141632	90.16956294	87.13512234
200320A00049	3/25/2020	1.47	3/25/2025	3/25/2020	101.54648	99.35793573	97.22690602	95.15145715	93.12973932	91.15998025	89.24048118	87.36961318	85.54581356
200424A00014	4/28/2020	1.01	4/23/2025	4/28/2020	100.57798	98.3251695	96.13344042	94.0007862	91.92527988	89.90506948	87.93837466	86.02348336	84.1587488
200826A00021	8/26/2020	0.83	8/26/2025	8/26/2020	100.38792	97.81120991	95.31285831	92.88999748	90.53988523	88.25989828	86.04752624	83.90036585	81.81611558
201019A00005	10/19/2020	0.79	10/20/2025	10/19/2020	100.37702	97.65777712	95.02510735	92.47577848	90.00669724	87.61490383	85.29756529	83.05196924	80.87551797
210304A00002	3/5/2021	0.93	7/10/2025	3/5/2021	100.55089	98.09476757	95.71071498	93.39620316	91.14880591	88.96619707	86.84614572	84.78651166	82.78524105
210610A00012	6/11/2021	1.9	6/10/2026	6/11/2021	104.68306	101.2816125	98.00884187	94.85921318	91.82745585	88.90855322	86.09772884	83.39043365	80.78233393
211210A00016	12/10/2021	1.76	12/10/2027	12/10/2021	106.71489	101.8253391	97.18837301	92.78966505	88.61577468	84.65408635	80.89275469	77.32065368	73.92732942
220314A00007	3/14/2022	2.44	3/12/2027	3/14/2022	108.44201	104.2350026	100.2154993	96.37410453	92.70195078	89.19066377	85.83233179	82.61947734	79.54503061
221129A00068	11/29/2022	4.28	11/29/2027	11/29/2022	119.05177	113.8917291	108.9923358	104.3390203	99.91809796	95.71671508	91.72279403	87.9249826	84.31260675
200316A00009	3/16/2020	1.25	3/14/2025	3/16/2020	101.01985	98.86665652	96.76948104	94.72646097	92.73581465	90.79583403	88.90488094	87.0613836	85.26383332
210218A00009	2/19/2021	0.62	7/15/2024	2/19/2021	99.377085	97.8779268	96.40853901	94.96810596	93.55584115	92.17098615	90.81280936	89.48060478	88.17369091
210225A00015	3/1/2021	0.7	8/26/2024	3/1/2021	99.545962	97.93532938	96.35808212	94.81324651	93.29988673	91.81710297	90.36402965	88.93983382	87.54371357
220715A00047	7/15/2022	3.44	7/15/2027	7/15/2022	113.77667	109.1163127	104.6772514	100.4477798	96.41687514	92.57415296	88.90982692	85.41467097	82.07998434
221129A00052	11/29/2022	4.56	12/2/2025	11/29/2022	111.48682	108.4931331	105.5970055	102.7947208	100.08273	97.4576384	94.9161977	92.45529916	90.07196662
200402A00048	4/2/2020	0.71	4/2/2024	4/2/2020	99.673245	98.43890643	97.23380064	96.05689549	94.90720696	93.78379642	92.68576807	91.6122665	90.56247443
201216A00013	12/16/2020	0.59	12/16/2025	12/16/2020	100.49655	97.61345579	94.82714543	92.13385453	89.52998775	87.01210907	84.57693377	82.22132083	79.94226584
220427A00011	4/29/2022	3.15	4/29/2027	4/29/2022	111.82778	107.4201436	103.2134612	99.19754099	95.36275561	91.70001163	88.20071743	84.85675298	81.66044163
220519A00010	5/19/2022	3.15	11/19/2026	5/19/2022	110.4187	106.4800808	102.7053012	99.08669882	95.61700695	92.28933432	89.09714382	86.0342324	83.09471233
220714A00035	7/14/2022	3.62	7/15/2024	7/14/2022	104.02648	102.4899434	100.9838364	99.50732022	98.05959131	96.63987467	95.24742278	93.88151426	92.54145282
220908A00029	9/8/2022	3.88	3/8/2024	9/8/2022	103.23133	102.0434076	100.8828895	99.74883369	98.64034138	97.55655417	96.49665174	95.45984972	94.44539781

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221207A00032	12/7/2022	4.52	12/7/2032	12/7/2022	136.18131	125.3701024	115.5582299	106.6465319	98.54622152	91.17774685	84.46978614	78.35835633	72.78602242
200327A00056	3/27/2020	1.18	3/27/2025	3/27/2020	100.90247	98.71593479	96.58700748	94.5137528	92.49431333	90.52690973	88.60983669	86.74145915	84.92020872
221214A00003	12/14/2022	4.26	12/12/2025	12/14/2022	110.72148	107.7114114	104.8004023	101.9846516	99.2605222	96.62453674	94.07336943	91.60383864	89.2128998
200330A00036	3/30/2020	0.86	3/30/2023	3/30/2020	100.00174	99.75357666	99.50664199	99.26092234	99.01640884	98.77309267	98.53096513	98.29001758	98.05024147
210526A00017	5/26/2021	2.13	5/26/2033	5/26/2021	113.07465	102.9526423	93.83513064	85.61678257	78.20381204	71.51266481	65.46885634	60.00594659	55.06463526
210610A00014	6/11/2021	2.03	6/10/2026	6/11/2021	105.13101	101.7218357	98.4415591	95.28463102	92.24577356	89.31996303	86.50241625	83.78857771	81.17410749
211210A00014	12/10/2021	1.54	12/10/2025	12/10/2021	102.67592	99.79070582	97.00124791	94.30385484	91.69500216	89.17132007	86.72958579	84.36671624	82.07976121
220411A00002	4/11/2022	3.18	4/9/2027	4/11/2022	111.7897	107.4364313	103.2794029	99.30868841	95.51492135	91.88925926	88.42335104	85.10930675	81.93966944
200306A00040	3/6/2020	1.01	3/6/2025	3/6/2020	100.47005	98.34434082	96.27353684	94.25582757	92.28948112	90.3728364	88.50429957	86.68234071	84.90549069
200325A00042	3/25/2020	1.58	3/25/2024	3/25/2020	100.51928	99.30369907	98.11734489	96.95917805	95.82820375	94.72347349	93.64408244	92.58916692	91.55790208
220921A00014	9/21/2022	4.08	9/21/2027	9/21/2022	117.38623	112.4571257	107.7688245	103.3081921	99.06288857	95.02131339	91.17255694	87.50635523	84.01304778
221213A00017	12/13/2022	4.1	12/14/2026	12/13/2022	114.39512	110.3106112	106.3979211	102.6489029	99.05583509	95.61140163	92.30866829	89.14106064	86.10234353
200305A00038	3/5/2020	1.51	3/5/2029	3/5/2020	105.81478	99.78673716	94.13836577	88.84381972	83.87914099	79.222115	74.85213475	70.75007619	66.89818391
201015A00030	10/19/2020	2.39	10/18/2027	10/19/2020	109.5058	104.6900282	100.1152972	95.76828047	91.63646233	87.70807999	83.97207423	80.41804364	77.036202
210119A00007	1/20/2021	0.51	8/25/2023	1/20/2021	99.611105	98.96316274	98.32360656	97.69227436	97.06900842	96.45365501	95.84606431	95.24609023	94.65359035
210629A00005	6/29/2021	1.25	6/29/2026	6/29/2021	102.5068	99.09425407	95.81302402	92.65736642	89.62182225	86.70119963	83.89055919	81.18520038	78.58064854
210803A00005	8/5/2021	2.06	8/4/2026	8/5/2021	105.55813	101.9953047	98.57197096	95.28190477	92.11919484	89.07822636	86.15366432	83.34043788	80.63372565
200518A00019	5/19/2020	0.9	5/19/2025	5/19/2020	100.3749	98.05604658	95.80183945	93.61012771	91.47884429	89.40600245	87.38969217	85.42807671	83.51938939
220204A00005	2/4/2022	1.83	1/10/2025	2/4/2022	102.00399	100.0103121	98.0655417	96.16817098	94.31674616	92.50986841	90.74619139	89.02441887	87.34330246
220920A00025	9/20/2022	4.23	9/18/2026	9/20/2022	113.88735	110.0524551	106.3701427	102.8334503	99.4357741	96.17085124	93.03273971	90.0157999	87.1146771
221216A00010	12/16/2022	4.27	12/16/2025	12/16/2022	110.79635	107.7741077	104.8516759	102.0252061	99.29102132	96.64560661	94.08560079	91.60778894	89.20909514
220622A00006	6/22/2022	3.58	6/22/2027	6/22/2022	114.19626	109.5898388	105.1994431	101.0137892	97.02223766	93.21475767	89.58188874	86.11470537	82.80478401
220920A00015	9/20/2022	4.33	10/21/2024	9/20/2022	106.21262	104.3933483	102.6142644	100.8742113	99.17207463	97.50678006	95.8772919	94.28261118	92.72177407
200327A00051	3/27/2020	0.99	3/27/2025	3/27/2020	100.942	98.74562765	96.6072969	94.52504761	92.49700402	90.52136944	88.59642211	86.72051139	84.89205413
200330A00011	3/30/2020	0.93	4/1/2024	3/30/2020	99.714892	98.48644848	97.2873202	96.11646557	94.97289171	93.85565182	92.76384246	91.69660121	90.65310424
210407A00012	4/7/2021	0.94	4/7/2025	4/7/2021	100.38526	98.17599875	96.02564811	93.9322413	91.89388934	89.90878087	87.9751783	86.09141413	84.25588752
220404A00014	4/4/2022	2.94	4/5/2027	4/4/2022	110.73345	106.4132717	102.2876613	98.34678212	94.58134774	90.98259217	87.54223751	84.25246377	81.1058808
221223A00035	12/23/2022	4.44	12/23/2025	12/23/2022	111.38311	108.3327311	105.3836452	102.5319232	99.77381208	97.10572543	94.52423471	92.02606152	89.60807008
220824A00011	8/24/2022	3.7	8/22/2025	8/24/2022	107.98551	105.317425	102.7294905	100.2187905	97.78254057	95.41807645	93.12284757	90.89441162	88.73042897
220929A00063	9/29/2022	4.38	9/29/2027	9/29/2022	118.89015	113.9039335	109.1617973	104.6503903	100.3571703	96.27035002	92.37884638	88.6722345	85.14070458
200318A00044	3/18/2020	1.17	3/18/2024	3/18/2020	100.23288	99.03403206	97.86365481	96.7207476	95.6043529	94.5135572	93.44748854	92.40531413	91.38623822
200331A00011	3/31/2020	1.09	3/31/2025	3/31/2020	100.71053	98.51560124	96.37875262	94.2980203	92.27152814	90.29747894	88.3741503	86.49989082	84.67311651
200408A00013	4/13/2020	0.87	4/14/2023	4/13/2020	99.9963	99.70708132	99.41954425	99.13367377	98.84945535	98.56687463	98.28591741	98.00656966	97.7288175

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200421A00028	4/21/2020	0.56	4/21/2023	4/21/2020	99.957616	99.64864983	99.34160155	99.03645329	98.73318735	98.43178627	98.13223281	97.83450992	97.53860078
201216A00003	12/16/2020	0.59	7/1/2024	12/16/2020	99.318172	97.85705186	96.42456174	95.01993537	93.64243324	92.29134145	90.96597063	89.66565492	88.3897509
220912A00046	11/15/2022	3.85	11/14/2025	11/15/2022	109.2289	106.316608	103.4980324	100.7696572	98.1281187	95.570197	93.0928092	90.69300272	88.36794905
210310A00015	3/11/2021	0.51	5/15/2023	3/11/2021	99.847443	99.47387067	99.10309498	98.73508456	98.36980848	98.00723628	97.64733794	97.2900839	96.93544502
210315A00003	3/15/2021	1.13	3/13/2026	3/15/2021	101.75088	98.63213465	95.62427134	92.72270053	89.92305002	87.22115631	84.61305312	82.09496058	79.66327519
210907A00008	9/7/2021	2.42	9/7/2038	9/7/2021	115.99102	101.4345851	88.93701229	78.19260922	68.94265166	60.96795252	54.08263992	48.12894096	42.97280443
221108A00041	11/8/2022	5.15	4/8/2024	11/8/2022	105.13911	103.8563978	102.6020525	101.3751266	100.1747186	98.99996638	97.85004538	96.72416623	95.62157308
221129A00086	11/29/2022	4.38	11/30/2026	11/29/2022	115.33207	111.2683431	107.3737735	103.6404142	100.0607357	96.62760012	93.33423805	90.17422797	87.14147639
221214A00031	12/14/2022	3.97	12/14/2027	12/14/2022	117.66914	112.5008401	107.5961624	102.9402311	98.51908992	94.31963725	90.32956955	86.53732865	82.93205281
200327A00048	3/27/2020	1.18	3/24/2025	3/27/2020	100.89385	98.71540866	96.59419844	94.52830078	92.51587614	90.55516196	88.64446879	86.78217647	84.96673071
200402A00035	4/2/2020	0.62	4/3/2023	4/2/2020	99.988672	99.72902225	99.47072444	99.21376805	98.9581426	98.70383774	98.45084319	98.1991488	97.94874454
221031A00042	10/31/2022	4.73	10/30/2026	10/31/2022	116.30207	112.3043257	108.4695374	104.790204	101.2592092	97.86979904	94.61556139	91.490407	88.48855157
200403A00025	4/3/2020	0.91	4/3/2024	4/3/2020	99.693749	98.46038356	97.25588242	96.07923632	94.92948306	93.80570441	92.70702369	91.63260339	90.58164301
210707A00008	7/9/2021	2.44	7/7/2031	7/9/2021	114.30939	105.8234997	98.04133584	90.90065679	84.34503252	78.32327286	72.78891636	67.69977147	63.01750423
220131A00003	1/31/2022	1.98	2/1/2027	1/31/2022	106.28248	102.2280821	98.35095169	94.64239575	91.09419326	87.69856956	84.44816946	81.33603218	78.35556797
221114A00019	11/14/2022	4.94	11/14/2023	11/14/2022	103.30667	102.4260499	101.5605117	100.7096652	99.87313793	99.05056978	98.24161269	97.4459301	96.66319648
221129A00041	11/29/2022	4.56	11/28/2025	11/29/2022	111.43886	108.4568238	105.5716292	102.7796061	100.077243	97.46118061	94.92820401	92.47523582	90.09932948
221129A00055	11/29/2022	4.56	12/3/2025	11/29/2022	111.49893	108.5022953	105.6033937	102.7985076	100.0840781	97.45670136	94.91312043	92.4502184	90.06501145
210629A00014	6/29/2021	1.78	12/28/2029	6/29/2021	107.70559	100.8683888	94.51128	88.59811067	83.09562154	77.97320471	73.20267976	68.75808984	64.61551571
211028A00021	10/28/2021	2.28	10/28/2033	10/28/2021	114.75821	104.182927	94.69207459	86.16818533	78.50707917	71.61630433	65.41376439	59.82651201	54.7896884
220512A00013	5/12/2022	3.18	5/12/2027	5/12/2022	112.06832	107.6197675	103.3755266	99.32515929	95.45881218	91.76718203	88.2414825	84.8734127	81.65512806
221110A00074	11/10/2022	4.75	11/12/2024	11/10/2022	107.22846	105.3403554	103.4951393	101.6915803	99.92849501	98.20474085	96.51921486	94.87085193	93.25862325
201030A00012	10/30/2020	0.63	10/30/2025	10/30/2020	100.53063	97.76921567	95.09676602	92.50996134	90.00562546	87.58071683	85.23232211	82.95765003	80.75402564
220315A00036	3/17/2022	2.63	3/16/2027	3/17/2022	109.26851	105.0333625	100.9871885	97.12050123	93.42434956	89.89028105	86.51031126	83.27689481	80.18289863
220715A00027	7/15/2022	3.44	7/15/2027	7/15/2022	113.77667	109.1163127	104.6772514	100.4477798	96.41687514	92.57415296	88.90982692	85.41467097	82.07998434
221014A00031	10/14/2022	4.89	4/12/2024	10/14/2022	104.85762	103.5664053	102.302638	101.0654377	99.85396625	98.66742076	97.50503196	96.36606234	95.24980452
200306A00066	3/6/2020	1.2	3/8/2027	3/6/2020	103.22569	99.13804564	95.23348841	91.50283656	87.93742013	84.52905109	81.26999362	78.15293635	75.17096649
200527A00014	5/27/2020	1.06	5/27/2026	5/27/2020	101.74827	98.43337802	95.24308187	92.17206617	89.21527011	86.3678741	83.62528705	80.98313424	78.43724597
210719A00009	7/19/2021	1.04	7/17/2026	7/19/2021	101.83195	98.38343715	95.06919429	91.88328	88.82005004	85.8741401	83.04045022	80.31413022	77.69056599
210914A00012	9/14/2021	1.18	9/14/2027	9/14/2021	104.67782	100.0325603	95.61822431	91.42211001	87.43228867	83.63754979	80.02735358	76.59178697	73.32152267
200228A00047	5/18/2020	1.35	5/18/2023	5/18/2020	100.17037	99.78782873	99.40820687	99.03147562	98.657602	98.2865535	97.91829811	97.55280433	97.1900411
210121A00017	1/25/2021	0.48	5/25/2023	1/25/2021	99.82402	99.42323192	99.0256542	98.63124809	98.23997577	97.8518	97.46668416	97.08459217	96.70548854
220217A00017	2/17/2022	2.27	1/29/2027	2/17/2022	107.44842	103.3785547	99.4860582	95.76225057	92.19892541	88.78832081	85.52309268	82.39628985	79.40133082

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221006A00097	10/6/2022	4.58	10/7/2024	10/6/2022	106.49811	104.7148613	102.9702541	101.2631312	99.59238306	97.95694393	96.35578908	94.78793308	93.2524278
201216A00001	12/16/2020	0.49	7/14/2023	12/16/2020	99.714001	99.17832501	98.64838707	98.12409529	97.60535974	97.0920924	96.58420708	96.08161943	95.58424683
220216A00003	2/16/2022	2.49	12/14/2029	2/16/2022	112.59626	105.6284896	99.14404932	93.10685897	87.48370768	82.24401231	77.35959699	72.80449236	68.55475233
221018A00030	10/18/2022	4.71	10/17/2025	10/18/2022	111.35672	108.490407	105.7138788	103.0238016	100.4169818	97.89036465	95.44102626	93.0661677	90.76310857
221102A00026	11/2/2022	4.66	11/2/2027	11/2/2022	120.56286	115.4421872	110.5761166	105.9506216	101.5525176	97.36940884	93.38963767	89.60223651	85.99688387
200312A00014	3/12/2020	1.04	3/12/2025	3/12/2020	101.00837	98.85153248	96.75086088	94.7044906	92.71063452	90.76757939	88.87368206	87.02736596	85.22711782
220727A00027	7/27/2022	3.23	7/27/2027	7/27/2022	112.92653	108.2520165	103.8010193	99.56164505	95.52269408	91.6736196	88.00448615	84.50593079	81.16912697
220811A00021	8/11/2022	3.47	8/11/2025	8/11/2022	107.27735	104.6480069	102.097054	99.62166966	97.21915356	94.88692028	92.62249377	90.42350186	88.28767115
220825A00022	8/25/2022	3.68	8/25/2025	8/25/2022	107.96115	105.2853983	102.6902049	100.1726392	97.7298955	95.35928967	93.05825252	90.82432417	88.65514849
220929A00041	9/29/2022	4.38	9/29/2027	9/29/2022	118.89015	113.9039335	109.1617973	104.6503903	100.3571703	96.27035002	92.37884638	88.6722345	85.14070458
221026A00022	10/26/2022	4.84	10/26/2023	10/26/2022	103.03354	102.2053917	101.3906006	100.5888421	99.79980484	99.02318748	98.25869797	97.50605343	96.7649797
221031A00061	10/31/2022	4.94	4/30/2024	10/31/2022	105.15778	103.8177585	102.5012475	101.2076827	99.9365143	98.68720969	97.4592527	96.25214301	95.06539556
210218A00011	2/22/2021	0.85	10/24/2025	2/22/2021	100.55398	97.82161554	95.17653797	92.61548962	90.13535659	87.73315821	85.40604057	83.15127028	80.96622873
220912A00050	11/15/2022	3.76	11/15/2027	11/15/2022	116.37644	111.3191546	106.5163989	101.9540143	97.61870291	93.49796919	89.58006772	85.85395433	82.30924083
221129A00045	11/29/2022	4.56	11/28/2025	11/29/2022	111.43886	108.4568238	105.5716292	102.7796061	100.077243	97.46118061	94.92820401	92.47523582	90.09932948
200114A00017	1/11/2021	1.93	1/11/2024	1/11/2021	100.77663	99.75426757	98.75257802	97.7709356	96.80874301	95.86542648	94.94043464	94.03323738	93.1433249
210629A00009	6/29/2021	1.14	12/31/2025	6/29/2021	101.5548	98.6308207	95.80583304	93.07595216	90.4374656	87.88682722	85.42064874	83.03569171	80.72886004
220114A00009	1/14/2022	1.74	4/21/2026	1/14/2022	103.88952	100.6336543	97.49655283	94.47325166	91.55902447	88.74936771	86.03998877	83.42679481	80.90588235
220419A00012	4/19/2022	2.21	4/19/2023	4/19/2022	100.40551	100.1017736	99.79988595	99.49982684	99.2015796	98.90512779	98.61045517	98.31754571	98.02638355
200306A00087	3/8/2021	1.26	3/7/2025	3/8/2021	101.02031	98.88580104	96.80644619	94.78042433	92.80599433	90.8814863	89.00529807	87.17589179	85.39179076
200402A00013	4/2/2020	0.89	4/2/2024	4/2/2020	99.666385	98.43573251	97.2341657	96.06065901	94.91423497	93.79396117	92.69894763	91.62834446	90.58133958
221011A00114	10/11/2022	4.66	8/12/2024	10/11/2022	105.95574	104.3276893	102.7327413	101.1699525	99.63841297	98.13724727	96.66561243	95.22269647	93.80771703
221107A00030	11/7/2022	4.7	11/5/2027	11/7/2022	120.79004	115.6556327	110.7768351	106.1395401	101.7304943	97.53723842	93.54805595	89.75192511	86.13847425
221019A00008	10/19/2022	4.8	10/17/2025	10/19/2022	111.60894	108.7390629	105.9590586	103.2655874	100.6554534	98.12559915	95.67309838	93.29514983	90.98907089
200225A00041	10/30/2020	1.48	10/30/2023	10/30/2020	100.24806	99.42189244	98.60927624	97.80987839	97.02337872	96.2494673	95.48784405	94.73821836	94.00030871
200826A00035	8/28/2020	0.78	8/28/2023	8/28/2020	99.782276	99.12568505	98.47768949	97.83812113	97.20681661	96.58361672	95.96836634	95.36091428	94.76111316
210217A00008	2/18/2021	0.63	8/15/2024	2/18/2021	99.420514	97.83938778	96.29066096	94.77340268	93.28671782	91.82974509	90.40165538	89.00165027	87.62896059
220421A00014	4/21/2022	3.24	5/30/2025	4/21/2022	106.06203	103.6442865	101.2942777	99.00972487	96.78844341	94.62833448	92.52738127	90.48364528	88.49526273
200316A00042	3/16/2020	1.23	3/15/2024	3/16/2020	100.07646	98.88996412	97.7314168	96.59983883	95.49429756	94.41390291	93.35780497	92.32519171	91.31528696
220913A00005	9/13/2022	4.09	9/13/2024	9/13/2022	105.37502	103.6664247	101.9938266	100.3561478	98.75235693	97.18146362	95.64251619	94.13459984	92.65683479
200108A00015	12/18/2020	1.98	12/18/2023	12/18/2020	100.77548	99.81662391	98.87595553	97.95296083	97.0471452	96.15803234	95.28516342	94.42809627	93.58640466
200429A00061	4/29/2020	1.66	10/29/2029	4/29/2020	106.82465	100.1664654	93.96621105	88.19011978	82.80707665	77.78839457	73.10761373	68.74031853	64.66397029
220901A00033	9/1/2022	3.72	9/1/2027	9/1/2022	115.45413	110.6258082	106.0315956	101.6588371	97.49563271	93.53078867	89.75377114	86.15466365	82.72412736

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
211207A00017	12/7/2021	1.3	11/15/2024	12/7/2021	100.77801	98.94392207	97.15190156	95.40074145	93.68927522	92.01637707	90.38096021	88.78197522	87.2184086
220421A00012	4/21/2022	3.31	4/21/2026	4/21/2022	109.08531	105.7433255	102.5224223	99.41755655	96.42392408	93.53694691	90.75226106	88.06570536	85.47331077
221130A00076	11/30/2022	4.15	11/30/2027	11/30/2022	119.54538	114.3356642	109.3900704	104.6937842	100.2328958	95.99434247	91.96585286	88.13589504	84.49362819
200325A00046	3/25/2020	1.76	3/25/2025	3/25/2020	102.19623	100.0002875	97.86201091	95.77946355	93.7507913	91.77421772	89.84804009	87.97062561	86.14040789
200325A00009	3/27/2020	1.67	3/27/2025	3/27/2020	102.00301	99.80390361	97.66267428	95.57736985	93.54612555	91.56715498	89.63874605	87.75925715	85.92711359
210318A00007	3/22/2021	1.41	3/21/2024	3/22/2021	100.30288	99.09919326	97.92422174	96.77694446	95.65639177	94.56163879	93.4918029	92.44604131	91.42354884
210624A00005	6/24/2021	1.22	6/24/2026	6/24/2021	102.38558	98.98793514	95.72056952	92.57781187	89.55426474	86.64479373	83.84451324	81.14877298	78.55314532
220623A00005	6/23/2022	3.45	6/23/2027	6/23/2022	113.62344	109.027049	104.6465044	100.4705151	96.48844122	92.69025209	89.06648773	85.60822358	82.3070374
200423A00022	4/28/2020	0.76	2/15/2023	4/28/2020	100.03111	99.90106261	99.7713689	99.64202468	99.51302852	99.38437898	99.25607465	99.1281141	99.00049594
201123A00011	11/25/2020	1.41	11/24/2025	11/25/2020	102.2375	99.4007566	96.65689233	94.00237745	91.43383915	88.94805043	86.54192296	84.21250031	81.95695161
221129A00060	11/29/2022	4.39	11/27/2026	11/29/2022	115.33521	111.2795886	107.3924606	103.6659311	100.0925135	96.66510923	93.37698578	90.2217559	87.19335802
221216A00049	12/16/2022	4.29	8/15/2025	12/16/2022	109.47036	106.8012346	104.2117221	101.6989512	99.26017353	96.89275834	94.59418636	92.36204441	90.19402012
200306A00080	11/6/2020	1.12	11/6/2023	11/6/2020	99.94247	99.09914973	98.26998907	97.45463359	96.65274085	95.86397966	95.08802963	94.3245807	93.57333275
200406A00059	4/6/2020	0.92	4/6/2023	4/6/2020	100.01665	99.74926327	99.48331097	99.21878104	98.95566204	98.69394267	98.43361174	98.17465819	97.91707107
220509A00013	7/15/2022	3.37	7/15/2027	7/15/2022	113.45911	108.8058951	104.3737297	100.1509182	96.12644761	92.2899432	88.63162765	85.14228356	81.81321837
220624A00003	6/24/2022	3.5	6/24/2027	6/24/2022	113.85618	109.2519445	104.8639802	100.6809693	96.69224684	92.88775865	89.25802304	85.79409519	82.48753395
200327A00073	3/27/2020	0.99	3/27/2025	3/27/2020	100.942	98.74562765	96.6072969	94.52504761	92.49700402	90.52136944	88.59642211	86.72051139	84.89205413
220624A00049	6/24/2022	3.29	6/24/2024	6/24/2022	103.64371	102.1622228	100.7094485	99.28462409	97.88701406	96.51590832	95.17062098	93.85048936	92.55487301
220705A00011	7/5/2022	3.14	7/7/2025	7/5/2022	106.12233	103.6030664	101.1570656	98.78176561	96.47471315	94.23355573	92.05603673	89.93999086	87.88333982
220823A00006	8/23/2022	3.66	2/23/2024	8/23/2022	102.87817	101.7295298	100.6065776	99.50845612	98.43434767	97.38347005	96.35507474	95.34844512	94.36289473
221005A00041	10/5/2022	4.3	10/5/2027	10/5/2022	118.57513	113.5793821	108.8290534	104.3106931	100.0116677	95.92010374	92.0248369	88.3153658	84.78180868
200305A00016	3/5/2020	0.99	3/6/2023	3/5/2020	100.05006	99.86772473	99.68605861	99.50505909	99.32472248	99.14504513	98.9660234	98.7876537	98.60993244
200417A00004	4/17/2020	0.86	4/17/2024	4/17/2020	99.657198	98.38866715	97.14587048	95.92803313	94.73441199	93.56429362	92.41699279	91.29185109	90.18823558
220831A00079	8/31/2022	3.79	8/29/2025	8/31/2022	108.29291	105.6020253	102.9923722	100.4609821	98.00501776	95.62176509	93.30862678	91.06311638	88.88285277
221027A00062	12/15/2022	4.45	12/15/2027	12/15/2022	120.00211	114.7755687	109.8149108	105.1051575	100.6322478	96.38298126	92.34496131	88.50654183	84.85677804
200305A00037	3/5/2020	1.43	3/6/2028	3/5/2020	105.21091	100.1327379	95.32827242	90.78133682	86.47680087	82.40050365	78.53918601	74.88042821	71.41259221
200407A00004	4/7/2020	0.99	4/7/2025	4/7/2020	100.97162	98.74600599	96.57987702	94.471241	92.41818633	90.41888019	88.47156457	86.57455259	84.72622495
210127A00010	1/27/2021	1.41	7/26/2030	1/27/2021	105.29012	98.01500695	91.28995306	85.07062164	79.31645979	73.99035933	69.0583479	64.4893093	60.25472996
200429A00049	4/29/2020	1.25	4/29/2026	4/29/2020	102.29425	99.04421252	95.91367463	92.89764774	89.99137282	87.19031313	84.49014264	81.88673515	79.37615403
210709A00005	7/9/2021	1.69	7/9/2031	7/9/2021	108.00561	99.77422817	92.23206646	85.31784921	78.97603939	73.15627488	67.8128624	62.90432327	58.39298549
211207A00012	12/7/2021	1.62	12/4/2026	12/7/2021	104.5386	100.6748192	96.97462204	93.43025546	90.03437061	86.78000298	83.66055031	80.66975179	77.80166868
220404A00013	4/4/2022	2.1	4/4/2023	4/4/2022	100.32576	100.0633376	99.80229266	99.54261199	99.28428489	99.02730076	98.77164915	98.51731968	98.2643021
221027A00050	10/27/2022	4.52	10/27/2027	10/27/2022	119.81968	114.7335643	109.8997844	105.3044603	100.934547	96.77777965	92.8226229	89.05822377	85.47436797

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200318A00013	3/18/2020	1.5	3/18/2025	3/18/2020	101.58746	99.41718213	97.30354687	95.24466781	93.23873619	91.28401839	89.37885207	87.5216426	85.71085965
200331A00007	3/31/2020	0.72	3/29/2024	3/31/2020	99.679905	98.45576906	97.26141765	96.0957763	94.95782124	93.8465768	92.76111265	91.7005412	90.66401513
211227A00009	12/27/2021	1.6	12/23/2026	12/27/2021	104.54755	100.6330772	96.88645876	93.29963099	89.86496082	86.57521984	83.42356067	80.40349479	77.50887184
220615A00010	6/15/2022	3.86	6/15/2027	6/15/2022	115.37969	110.7658991	106.3672861	102.1726642	98.17148358	94.3537952	90.71021305	87.2318795	83.9104328
220630A00036	6/30/2022	3.42	6/30/2027	6/30/2022	113.54998	108.9365209	104.5405887	100.3507629	96.35627962	92.54699394	88.91334046	85.44629741	82.13735284
220829A00057	8/29/2022	3.67	8/31/2026	8/29/2022	111.62238	107.877882	104.2811681	100.8255616	97.5047258	94.31264697	91.24361607	88.29221117	85.45328121
221129A00083	11/29/2022	4.38	11/30/2026	11/29/2022	115.33207	111.2683431	107.3737735	103.6404142	100.0607357	96.62760012	93.33423805	90.17422797	87.14147639
200304A00002	3/4/2020	0.98	3/4/2025	3/4/2020	100.85243	98.71883295	96.64037106	94.61523039	92.64167143	90.71802581	88.84269267	87.01413538	85.23087834
200327A00047	3/27/2020	0.99	3/27/2025	3/27/2020	100.942	98.74562765	96.6072969	94.52504761	92.49700402	90.52136944	88.59642211	86.72051139	84.89205413
200310A00003	3/10/2020	1.1	3/10/2025	3/10/2020	100.67765	98.53896765	96.45572748	94.42609597	92.44831683	90.52070601	88.64164798	86.80959235	85.02305065
200330A00044	3/30/2020	1.09	3/28/2025	3/30/2020	100.70296	98.51603913	96.38680474	94.31331678	92.29371322	90.3262104	88.40909896	86.54074005	84.71956176
210616A00011	5/2/2022	0.95	5/2/2025	5/2/2022	100.4567	98.18195945	95.96948437	93.81724269	91.72327837	89.68570991	87.702727	85.77258749	83.89361438
220217A00012	2/17/2022	2.28	2/16/2027	2/17/2022	107.612	103.4884282	99.54637147	95.77685172	92.17139018	88.72197261	85.42102103	82.26136741	79.23622906
220325A00011	3/28/2022	2.79	4/25/2025	3/28/2022	104.72085	102.4139961	100.1695182	97.98537974	95.8596197	93.79035263	91.77576549	89.81411441	87.90372151
220701A00024	7/1/2022	3.08	7/1/2025	7/1/2022	105.92134	103.4210983	100.9932529	98.63529116	96.34480067	94.11946763	91.95707183	89.85548237	87.81265343
220729A00047	7/29/2022	3.06	1/29/2027	7/29/2022	110.67246	106.5371563	102.5812912	98.79610571	95.17331453	91.70508057	88.38398804	85.20301742	82.15552198
220907A00010	9/7/2022	3.9	9/9/2032	9/7/2022	131.97626	121.4823998	111.9474235	103.2775197	95.38855103	88.20501132	81.65909793	75.68988766	70.24260496
221214A00030	12/14/2022	4.02	12/14/2027	12/14/2022	117.91667	112.7423173	107.8318048	103.1702533	98.74369661	94.53902405	90.5439233	86.7468279	83.13686826
200306A00022	3/6/2020	1.2	3/8/2027	3/6/2020	103.22569	99.13804564	95.23348841	91.50283656	87.93742013	84.52905109	81.26999362	78.15293635	75.17096649
200327A00030	3/27/2020	1.01	3/27/2024	3/27/2020	99.81078	98.59460646	97.4078352	96.24941128	95.11832966	94.01363227	92.93440533	91.8797768	90.848914
200330A00038	3/30/2020	1.79	3/29/2030	3/30/2020	107.93328	100.8563688	94.29165722	88.1994171	82.54319971	77.28955039	72.40774754	67.86956553	63.6490596
210201A00007	2/3/2021	0.57	8/15/2024	2/3/2021	99.322442	97.74214517	96.19423231	94.67777365	93.19187446	91.73567382	90.30834298	88.90908388	87.53712767
210616A00007	3/18/2022	0.9	3/18/2025	3/18/2022	100.25461	98.09938891	96.0005016	93.95607002	91.96429413	90.02344867	88.13187937	86.28799936	84.49028578
221110A00075	11/10/2022	4.56	11/10/2025	11/10/2022	111.22537	108.2949295	105.4582466	102.7118156	100.0522858	97.47644903	94.98123306	92.56369505	90.22101536
200302A00018	3/2/2020	1.25	3/2/2023	3/2/2020	100.09746	99.92605648	99.75524311	99.58501322	99.41536383	99.24629201	99.07779481	98.90986934	98.7425127
200316A00037	3/16/2020	1.06	3/14/2025	3/16/2020	101.05885	98.89606415	96.78971099	94.73790822	92.73885664	90.79083161	88.89217924	87.04131286	85.23670961
200611A00023	6/11/2020	0.64	6/12/2023	6/11/2020	99.859327	99.40962934	98.96397732	98.52231637	98.08459297	97.65075456	97.22074949	96.79452704	96.37203739
201001A00011	10/1/2020	0.71	6/17/2025	10/1/2020	99.959935	97.57111258	95.25098842	92.99720317	90.8074932	88.67968586	86.61169524	84.6015181	82.64723011
201030A00019	10/30/2020	1.15	10/29/2027	10/30/2020	103.5844	98.88019493	94.41479562	90.17492016	86.14808767	82.32256803	78.6873331	75.23201129	71.94684537
220214A00012	2/14/2022	2.47	12/28/2029	2/14/2022	112.50171	105.5009397	98.98839528	92.92743471	87.28434781	82.02810592	77.13013576	72.56411344	68.3057767
210127A00008	1/27/2021	0.93	1/27/2027	1/27/2021	101.97449	98.02085778	94.24066998	90.62541563	87.16704893	83.85796027	80.69095011	77.65920455	74.75627249
211028A00020	10/28/2021	2.05	1/28/2031	10/28/2021	110.58528	102.6524079	95.35004663	88.62474981	82.42785877	76.71505349	71.4459453	66.5837096	62.09475469
200826A00038	8/28/2020	1.11	8/28/2024	8/28/2020	100.21632	98.59502636	97.00738614	95.45241811	93.92917669	92.43675279	90.97427204	89.5408931	88.13580606

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210312A00008	3/12/2021	1.13	3/12/2026	3/12/2021	101.74767	98.63162596	95.62629141	92.7270852	89.92964514	87.2298171	84.62364354	82.10735277	79.67734893
210330A00022	3/30/2021	1.27	3/30/2026	3/30/2021	102.26042	99.08830893	96.03027926	93.0815417	90.23754515	87.49395894	84.84666053	82.29172385	79.82540857
210907A00009	9/7/2021	2.5	9/7/2039	9/7/2021	116.53776	101.2195141	88.18277818	77.07082771	67.58459199	59.47307627	52.52541334	46.564263	41.44032527
210914A00017	9/14/2021	1.32	9/14/2028	9/14/2021	105.99149	100.3537589	95.0480395	90.05307098	85.34906826	80.91760909	76.74153281	72.80484711	69.09264233
220131A00006	1/31/2022	1.83	2/1/2027	1/31/2022	106.54638	102.4617823	98.55633546	94.82122798	91.24812953	87.82916328	84.55687854	81.42422526	78.42453021
220628A00052	8/15/2022	3.6	8/13/2027	8/15/2022	114.77249	110.0098151	105.4762066	101.1593819	97.04778929	93.13055617	89.39744512	85.83881328	82.44557447
221229A00075	12/29/2022	5.2	12/29/2037	12/29/2022	155.80177	138.9799348	124.3388154	111.5750385	100.429375	90.68008353	82.13729187	74.638246	68.04329046
220829A00048	8/29/2022	3.75	2/25/2025	8/29/2022	106.37692	104.2103966	102.0989966	100.0409266	98.03446918	96.07797589	94.1698642	92.3086142	90.49276556
221117A00014	11/17/2022	4.54	11/14/2025	11/17/2022	111.21523	108.2741617	105.4275051	102.6717261	100.0034391	97.41940332	94.91651582	92.49180466	90.14242277
200316A00055	3/16/2020	1.06	3/14/2025	3/16/2020	101.05885	98.89606415	96.78971099	94.73790822	92.73885664	90.79083161	88.89217924	87.04131286	85.23670961
220609A00038	10/3/2022	3.28	3/29/2024	10/3/2022	102.65879	101.4185874	100.2083567	99.0270166	97.87354116	96.74695251	95.6463181	94.57074808	93.51939285
220630A00019	6/30/2022	3.25	12/29/2023	6/30/2022	102.07554	101.0805661	100.1049785	99.14821696	98.20974017	97.28902753	96.385578	95.49890924	94.62855672
220719A00004	7/19/2022	3.46	7/19/2027	7/19/2022	113.90409	109.2297183	104.7777024	100.5362604	96.49429758	92.64136318	88.9676094	85.46375341	82.12104192
220906A00046	9/6/2022	3.79	9/7/2027	9/6/2022	115.83645	110.9830197	106.3655002	101.9711005	97.78779859	93.80428833	90.00993209	86.39471758	82.94921741
220908A00030	9/8/2022	3.85	9/9/2024	9/8/2022	104.9078	103.2142337	101.5561928	99.93261819	98.34249727	96.78485734	95.25876351	93.76331688	92.29765276
221130A00019	11/30/2022	4.63	11/26/2025	11/30/2022	111.61894	108.6396506	105.7569303	102.9671258	100.2667416	97.6524329	95.12099886	92.66937516	90.29462754
200423A00017	4/23/2020	1.82	4/23/2035	4/23/2020	112.11174	100.2597976	89.78344276	80.51525037	72.30896143	65.03671477	58.58665188	52.86084388	47.77349577
200429A00057	4/29/2020	1.4	4/29/2027	4/29/2020	104.25628	100.0112747	95.96182944	92.09797004	88.41028245	84.88987638	81.52835351	78.31777787	75.25064807
201118A00009	11/18/2020	0.61	11/18/2025	11/18/2020	100.50518	97.69522666	94.97730013	92.3479106	89.80372024	87.34153525	84.95829877	82.65108429	80.41708931
210216A00011	2/17/2021	0.83	12/15/2025	2/17/2021	100.59145	97.72400556	94.95242099	92.27297873	89.68213088	87.17648609	84.75280176	82.40797662	80.13904374
211119A00009	11/19/2021	1.68	11/19/2027	11/19/2021	106.25539	101.4317504	96.85474064	92.51051831	88.38608926	84.46924821	80.74852699	77.2131464	73.85297146
220325A00020	3/28/2022	2.86	3/23/2027	3/28/2022	110.29173	106.016028	101.9315945	98.02879846	94.29855194	90.73227544	87.32186632	84.05966924	80.93844871
220624A00033	6/24/2022	3.5	6/24/2027	6/24/2022	113.85618	109.2519445	104.8639802	100.6809693	96.69224684	92.88775865	89.25802304	85.79409519	82.48753395
200401A00023	4/1/2020	0.82	4/1/2025	4/1/2020	100.57096	98.36559004	96.21882218	94.12867179	92.09324322	90.11072053	88.17936334	86.29750299	84.46353888
200413A00027	4/13/2020	0.94	4/12/2024	4/13/2020	99.75103	98.49450514	97.26483765	96.06116816	94.8826741	93.72856772	92.59809421	91.49053002	90.4051812
210224A00007	2/26/2021	0.68	10/21/2024	2/26/2021	99.578494	97.82116507	96.10287617	94.42250234	92.77895994	91.17120442	89.5982286	88.05906101	86.55276437
211214A00013	12/14/2021	1.02	12/14/2023	12/14/2021	99.832095	98.88886739	97.96336011	97.05507773	96.16354305	95.28829636	94.42889461	93.58491071	92.7559328
220329A00009	3/29/2022	2.94	3/29/2029	3/29/2022	114.71143	108.3497706	102.3875443	96.79747842	91.55430717	86.63461375	82.01668515	77.68037904	73.60700184
220419A00014	4/19/2022	3.06	4/18/2025	4/19/2022	105.29487	102.999735	100.7661776	98.59216629	96.47575281	94.41506607	92.40830844	90.45375233	88.54973692
220617A00040	6/17/2022	3.23	6/16/2023	6/17/2022	101.0591	100.5952609	100.1356859	99.68031676	99.22909569	98.78196611	98.33887241	97.89976	97.46457527
210226A00002	2/26/2021	0.86	2/26/2025	2/26/2021	100.12502	98.02462268	95.97807257	93.98361294	92.0395595	90.14429604	88.29627107	86.49399469	84.73603556
210629A00015	6/29/2021	1.89	6/27/2031	6/29/2021	109.6603	101.3905511	93.80922276	86.8553874	80.47379975	74.6143415	69.23152188	64.28402921	59.73432789
210719A00004	7/19/2021	1	4/20/2026	7/19/2021	101.43793	98.22527186	95.13009796	92.14749509	89.27278064	86.50149312	83.82938039	81.25238863	78.76665183

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210907A00004	9/7/2021	2.01	9/7/2033	9/7/2021	111.8925	101.5849478	92.32652415	84.00453876	76.5189547	69.78090734	63.71140518	58.2401876	53.30471986
220216A00002	2/16/2022	2.09	2/14/2025	2/16/2022	102.7216	100.6260644	98.58350006	96.59220171	94.65053546	92.75693239	90.90988533	89.10794596	87.34972198
220418A00016	4/22/2022	3.11	9/15/2026	4/22/2022	109.69692	105.947746	102.3482752	98.89166956	95.57144476	92.38145093	89.31585325	86.3691137	83.53597395
200311A00055	3/11/2020	1.66	12/17/2027	3/11/2020	106.19138	101.2977615	96.65802022	92.25770342	88.08325098	84.12193844	80.36182125	76.79168307	73.40098773
210623A00028	6/23/2021	1.22	6/23/2026	6/23/2021	102.38233	98.98728972	95.72234115	92.58181793	89.56033449	86.65276758	83.85424196	81.16011707	78.56597435
221129A00056	11/29/2022	4.31	11/29/2027	11/29/2022	119.19907	114.0354496	109.1326114	104.4759768	100.0518554	95.8473883	91.85049266	88.04981146	84.43466608
221213A00052	12/13/2022	4.02	12/14/2027	12/13/2022	117.91667	112.7423173	107.8318048	103.1702533	98.74369661	94.53902405	90.5439233	86.7468279	83.13686826
221220A00024	12/20/2022	4.7	12/20/2024	12/20/2022	107.59734	105.602523	103.6553032	101.7542488	99.89798172	98.0851744	96.31454763	94.58486845	92.89494816
200818A00016	3/31/2021	0.57	4/1/2024	3/31/2021	99.26032	98.03489509	96.83873469	95.67079846	94.5300949	93.4156785	92.32664712	91.26213953	90.2213331
221110A00032	11/10/2022	4.75	11/12/2024	11/10/2022	107.22846	105.3403554	103.4951393	101.6915803	99.92849501	98.20474085	96.51921486	94.87085193	93.25862325
220511A00002	5/11/2022	3.18	5/12/2025	5/11/2022	105.76733	103.4021777	101.1020669	98.86485254	96.68847423	94.57095087	92.51037726	90.50492072	88.55281787
220817A00047	8/17/2022	3.29	8/17/2027	8/17/2022	114.40692	109.6105736	105.0463217	100.7016546	96.56481029	92.62472176	88.87097182	85.29375131	81.8838202
200305A00001	3/5/2020	1.14	3/5/2025	3/5/2020	100.75181	98.62563225	96.55429895	94.53600571	92.56902459	90.65169819	88.7824361	86.95971162	85.18205861
200323A00011	3/23/2020	1.37	3/23/2023	3/23/2020	100.12633	99.89718051	99.66908142	99.44202939	99.2160172	98.9910377	98.76708383	98.54414856	98.32222496
210309A00002	3/11/2021	0.77	7/25/2024	3/11/2021	99.623347	98.0953537	96.59799281	95.13041112	93.69178711	92.28132913	90.89827406	89.541886	88.21145503
220209A00010	2/9/2022	2.14	1/11/2027	2/9/2022	106.81078	102.8011201	98.96473245	95.29321507	91.77861796	88.41341728	85.19049017	82.10309109	79.1448298
220419A00013	4/19/2022	2.84	4/19/2024	4/19/2022	102.25872	100.9672273	99.70132218	98.46026075	97.24332376	96.04981994	94.87908461	93.73047841	92.60338607
221130A00061	11/30/2022	5.05	11/30/2023	11/30/2022	103.56944	102.644497	101.7361346	100.8439124	99.96740226	99.1061914	98.25988121	97.42808685	96.61043667
201221A00015	12/21/2020	0.88	12/4/2026	12/21/2020	101.63163	97.82471983	94.17964581	90.68872256	87.34466612	84.14057391	81.06990274	78.12644823	75.30432551
211209A00006	12/9/2021	1.61	12/8/2026	12/9/2021	104.51785	100.6438361	96.93428719	93.38138604	89.97772501	86.71628495	83.59041284	80.59380075	77.72046611
220705A00005	7/5/2022	3.15	1/5/2024	7/5/2022	102.0134	101.0001221	100.0069663	99.03333887	98.07866771	97.1424028	96.22401524	95.32299623	94.43885614
221110A00025	11/10/2022	4.39	11/10/2026	11/10/2022	115.13101	111.1256356	107.284921	103.6012323	100.0673259	96.67632952	93.42172175	90.29731181	87.29722134
200402A00009	4/2/2020	1.03	4/2/2025	4/2/2020	100.5794	98.38080531	96.24052129	94.15658078	92.12710427	90.15029081	88.22441396	86.34781801	84.51891441
201001A00012	10/1/2020	0.74	9/16/2025	10/1/2020	100.17998	97.55230394	95.00590313	92.53774547	90.14493638	87.82470964	85.57442069	83.39154028	81.27364847
220218A00003	2/18/2022	2.16	9/4/2026	2/18/2022	106.1059	102.4519601	98.94363833	95.57431053	92.33769648	89.22783783	86.23907951	83.36605232	80.60365663
220408A00012	4/8/2022	3.12	6/29/2026	4/8/2022	109.04715	105.5202569	102.127891	98.86419229	95.72359083	92.70078836	89.79074378	86.98865914	84.28996654
221117A00012	11/17/2022	4.54	11/14/2025	11/17/2022	111.21523	108.2741617	105.4275051	102.6717261	100.0034391	97.41940332	94.91651582	92.49180466	90.14242277
221129A00071	11/29/2022	4.28	11/26/2027	11/29/2022	119.02135	113.8702334	108.9789357	104.3329484	99.91864941	95.72324272	91.73470369	87.94172882	84.33368893
200316A00043	3/16/2020	1.3	3/14/2025	3/16/2020	101.13037	98.9759388	96.87754602	94.83333339	92.84151853	90.90039268	89.00831704	87.16371917	85.36508978
200402A00010	4/2/2020	0.89	4/2/2024	4/2/2020	99.666385	98.43573251	97.2341657	96.06065901	94.91423497	93.79396117	92.69894763	91.62834446	90.58133958
211115A00032	11/15/2021	1.75	11/12/2027	11/15/2021	106.5247	101.7141515	97.14854622	92.81419212	88.69823055	84.78858047	81.07388763	77.54347734	74.18731052
220209A00012	2/9/2022	1.98	7/29/2025	2/9/2022	103.30979	100.7669764	98.29958654	95.90492844	93.58042633	91.32361278	89.13212341	87.00369181	84.93614483
220317A00011	3/17/2022	2.48	3/17/2025	3/17/2022	103.75803	101.5659333	99.43086	97.3509127	95.32427432	93.34920316	91.424029	89.5471495	87.71702681

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200327A00058	3/27/2020	0.9	3/27/2023	3/27/2020	100.01445	99.77450103	99.53570019	99.29804129	99.06151618	98.82611678	98.5918351	98.35866322	98.12659329
220301A00015	3/1/2022	2	1/4/2027	3/1/2022	106.20733	102.2281175	98.4203825	94.77583375	91.28662786	87.94534027	84.74494054	81.67876932	78.74051671
221006A00012	10/6/2022	4.37	10/6/2027	10/6/2022	118.91928	113.9125857	109.1518681	104.6236495	100.3152677	96.21482133	92.31111999	88.59363739	85.05246825
221110A00038	11/10/2022	4.34	11/10/2027	11/10/2022	119.0978	113.9902546	109.1381682	104.5273989	100.1446554	95.9774457	92.01402481	88.24334635	84.6550176
200310A00054	3/10/2020	1.1	3/10/2025	3/10/2020	100.67765	98.53896765	96.45572748	94.42609597	92.44831683	90.52070601	88.64164798	86.80959235	85.02305065
200611A00020	6/11/2020	0.81	6/11/2025	6/11/2020	100.19792	97.82144064	95.51285466	93.26984789	91.09019715	88.971768	86.9125106	84.91045583	82.96371164
211221A00025	12/21/2021	1.59	12/21/2026	12/21/2021	104.49859	100.590401	96.8495845	93.2681116	89.83838052	86.55319196	83.40572555	80.3895179	77.49844203
220309A00010	3/9/2022	2.27	3/8/2027	3/9/2022	107.70335	103.5225738	99.52789748	95.71001465	92.06013891	88.56997135	85.23167052	82.03782438	78.98142416
220913A00017	9/13/2022	3.98	9/14/2026	9/13/2022	112.91378	109.1077568	105.4529846	101.942576	98.56999623	95.32904709	92.21384725	89.21881394	86.3386458
200330A00066	3/30/2020	1.08	3/31/2025	3/30/2020	100.68796	98.49329106	96.35669587	94.27621175	92.24996274	90.27615177	88.35305659	86.47902593	84.65247593
220823A00009	8/23/2022	3.52	8/23/2027	8/23/2022	114.4422	109.6615402	105.1119808	100.7810708	96.65710308	92.7290623	88.98657985	85.41989236	82.01980284
200312A00006	3/12/2020	1.23	3/12/2025	3/12/2020	100.96962	98.82232842	96.73079633	94.69317281	92.70768815	90.77264556	88.88641749	87.04744219	85.25422042
201116A00021	11/16/2020	0.53	11/15/2024	11/16/2020	99.694915	97.86450345	96.07623414	94.32889315	92.62130896	90.95235105	89.3209282	87.72598683	86.16650951
211220A00005	12/20/2021	0.97	12/20/2023	12/20/2021	99.789462	98.83050425	97.88986493	96.96702299	96.0614773	95.17274541	94.30036267	93.44388138	92.60287009
220420A00033	4/20/2022	3.29	4/20/2027	4/20/2022	112.35526	107.9604366	103.7648271	99.75834131	95.9314551	92.27517433	88.78100267	85.44091123	82.2473104
200225A00040	10/30/2020	1.48	10/30/2023	10/30/2020	100.24806	99.42189244	98.60927624	97.80987839	97.02337872	96.2494673	95.48784405	94.73821836	94.00030871
210219A00008	2/22/2021	0.86	12/1/2025	2/22/2021	100.65187	97.82036396	95.08231081	92.43413984	89.87243479	87.39392804	84.99549335	82.6741389	80.42700071
220509A00014	7/15/2022	3.37	7/15/2027	7/15/2022	113.45911	108.8058951	104.3737297	100.1509182	96.12644761	92.2899432	88.63162765	85.14228356	81.81321837
220509A00016	7/15/2022	3.37	7/15/2027	7/15/2022	113.45911	108.8058951	104.3737297	100.1509182	96.12644761	92.2899432	88.63162765	85.14228356	81.81321837
200327A00060	3/27/2020	1.18	3/27/2025	3/27/2020	100.90247	98.71593479	96.58700748	94.5137528	92.49431333	90.52690973	88.60983669	86.74145915	84.92020872
221216A00008	12/16/2022	4.27	12/16/2025	12/16/2022	110.79635	107.7741077	104.8516759	102.0252061	99.29102132	96.64560661	94.08560079	91.60778894	89.20909514
200320A00052	3/25/2020	1.47	3/25/2025	3/25/2020	101.54648	99.35793573	97.22690602	95.15145715	93.12973932	91.15998025	89.24048118	87.36961318	85.54581356
220929A00034	9/29/2022	4.67	5/31/2024	9/29/2022	105.13514	103.7105218	102.312297	100.9397943	99.5923646	98.26938003	96.97023337	95.69433703	94.44112235
221129A00050	11/29/2022	4.56	12/2/2025	11/29/2022	111.48682	108.4931331	105.5970055	102.7947208	100.08273	97.4576384	94.9161977	92.45529916	90.07196662
221130A00110	11/30/2022	4.15	11/30/2027	11/30/2022	118.42327	113.2757623	108.3886121	103.7472497	99.33799431	95.1479962	91.16518224	87.3782049	83.77639509
200304A00005	3/4/2020	0.98	3/4/2025	3/4/2020	100.85243	98.71883295	96.64037106	94.61523039	92.64167143	90.71802581	88.84269267	87.01413538	85.23087834
200327A00046	3/27/2020	1.23	3/27/2025	3/27/2020	101.01477	98.82695202	96.6967694	94.62228515	92.6016411	90.6330572	88.71482744	86.84531609	85.02295412
210707A00002	7/7/2021	1.12	6/26/2026	7/7/2021	102.04317	98.64637968	95.380097	92.23862344	89.21654358	86.30870638	83.51021084	80.81639236	78.22281009
210712A00010	6/27/2022	1.05	6/27/2025	6/27/2022	100.82115	98.3959639	96.04116878	93.75432527	91.53309128	89.37521987	87.2785548	85.24102623	83.26064672
221020A00052	10/20/2022	4.95	10/21/2024	10/20/2022	107.33951	105.5097191	103.7203084	101.9701181	100.2580284	98.58296004	96.94387252	95.33976216	93.76966065
210701A00007	7/1/2021	1.22	7/1/2026	7/1/2021	102.40897	98.99290713	95.70849092	92.54995223	89.51181099	86.58885572	83.77612875	81.06891252	78.46271648
211210A00015	12/10/2021	1.63	12/10/2026	12/10/2021	104.60601	100.7249467	97.0088487	93.44986506	90.04055636	86.77387397	83.64313739	80.64201311	77.76449475
220111A00002	1/11/2022	1.75	1/16/2026	1/11/2022	103.46037	100.4658939	97.57358507	94.77939154	92.07944472	89.47005168	86.94768599	84.50897917	82.15071262

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220209A00004	2/9/2022	1.21	2/9/2023	2/9/2022	100.08896	99.97538564	99.8620777	99.7490387	99.63626766	99.52376358	99.4115255	99.29955243	99.18784342
200402A00003	4/2/2020	0.8	4/3/2023	4/2/2020	99.98386	99.72477534	99.46703325	99.21062334	98.95553531	98.70175894	98.44928415	98.19810093	97.94819939
200527A00016	5/27/2020	0.92	5/27/2025	5/27/2020	100.43981	98.09896393	95.82392241	93.61247906	91.46251265	89.37198511	87.33893778	85.36148784	83.43782487
220204A00003	2/4/2022	1.15	2/3/2023	2/4/2022	100.0803	99.98329151	99.88647791	99.78985761	99.69343003	99.59719458	99.50115067	99.40529772	99.30963515
220624A00044	6/24/2022	3.43	6/24/2025	6/24/2022	106.73804	104.2459936	101.8255497	99.47423488	97.18968062	94.96961427	92.81185447	90.71430691	88.67496029
221020A00046	10/20/2022	4.95	1/21/2025	10/20/2022	108.50612	106.4150576	104.3754176	102.3855947	100.4440463	98.54928906	96.69989595	94.89449389	93.13176118
221223A00016	12/23/2022	4.73	12/23/2024	12/23/2022	107.6939	105.68986	103.7338195	101.8243319	99.96000214	98.13948641	96.36149014	94.62476574	92.92811058
200401A00013	4/1/2020	1.01	4/1/2025	4/1/2020	100.53206	98.33659903	96.1993009	94.11820652	92.09143884	90.11719952	88.19376484	86.31948194	84.4927652
200826A00039	8/28/2020	1.03	7/29/2024	8/28/2020	100.04176	98.49959073	96.98844851	95.50746462	94.05580212	92.63265474	91.23724546	89.86882517	88.52667144
210208A00008	2/11/2021	0.78	11/17/2025	2/11/2021	100.39582	97.60385931	94.90298642	92.28975813	89.76088221	87.31320793	84.94371914	82.6495278	80.4278678
210706A00015	7/6/2021	1.06	12/31/2025	7/6/2021	101.31425	98.39390591	95.57246105	92.8460348	90.21091761	87.66356611	85.2005947	82.81876751	80.51499089
200305A00019	3/5/2020	0.81	3/6/2023	3/5/2020	100.05356	99.87084183	99.68879861	99.50742757	99.32672494	99.14668696	98.96730994	98.78859018	98.61052401
200403A00010	4/6/2020	0.8	4/6/2023	4/6/2020	99.984358	99.71702898	99.45113389	99.18666093	98.92359867	98.66193581	98.40166116	98.14276365	97.88523235
220302A00011	3/2/2022	2.14	1/13/2027	3/2/2022	106.82268	102.8075261	98.96605931	95.28984875	91.77091761	88.40171718	85.17510151	82.08430362	79.12291338
200220A00034	2/25/2020	1.71	3/27/2023	2/25/2020	100.20998	99.96971057	99.73059232	99.49261717	99.25577697	99.02006365	98.7854692	98.55198569	98.31960527
200302A00017	3/2/2020	1.3	3/4/2024	3/2/2020	100.13956	98.98167971	97.85040315	96.74482039	95.66406449	94.60730711	93.57375635	92.56265483	91.5732778
200330A00054	3/30/2021	1.19	3/30/2026	3/30/2021	102.00046	98.83258534	95.77867582	92.83394991	89.99386023	87.25407971	84.6104892	82.05916596	79.59637279
200331A00017	3/31/2020	0.9	3/31/2025	3/31/2020	100.74981	98.54499161	96.3986796	94.3088968	92.2737485	90.29141993	88.36017205	86.4783377	84.64431793
221129A00084	11/29/2022	4.38	11/30/2026	11/29/2022	115.33207	111.2683431	107.3737735	103.6404142	100.0607357	96.62760012	93.33423805	90.17422797	87.14147639
200325A00047	3/25/2020	1.68	9/25/2024	3/25/2020	101.27298	99.56971701	97.90294446	96.27154989	94.67447079	93.11068755	91.57922126	90.07913159	88.60951494
200415A00024	4/15/2020	2.2	4/16/2035	4/15/2020	113.96413	102.1898591	91.76775614	82.53441268	74.3469651	67.08041985	60.62533775	54.88582841	49.77781186
220404A00010	4/4/2022	2.93	4/2/2027	4/4/2022	110.66771	106.356919	102.2399629	98.30703836	94.54889872	90.95681632	87.52254999	84.23831491	81.09675452
220627A00055	6/27/2022	3.55	6/26/2026	6/27/2022	110.52225	106.9775504	103.567498	100.2862509	97.12825049	94.08820865	91.16109315	88.34211382	85.62670954
210308A00009	3/8/2021	0.62	3/8/2024	3/8/2021	99.329332	98.16608762	97.02984927	95.91968651	94.83471087	93.7740738	92.73696449	91.72260775	90.73026211
220628A00053	8/15/2022	3.6	8/13/2027	8/15/2022	114.77249	110.0098151	105.4762066	101.1593819	97.04778929	93.13055617	89.39744512	85.83881328	82.44557447
210104A00011	11/23/2021	0.88	11/23/2026	11/23/2021	101.60399	97.82590922	94.20730377	90.74065024	87.41881952	84.23505304	81.1829415	78.25640509	75.44967483
210122A00006	1/25/2021	0.61	8/15/2024	1/25/2021	99.387823	97.80697358	96.25851807	94.74152633	93.25510337	91.798388	90.37055125	88.97079481	87.59834961
210303A00006	3/4/2021	0.97	10/10/2025	3/4/2021	100.85886	98.15936889	95.54500394	93.0125688	90.5590112	88.18141333	85.8769849	83.64305662	81.477074
210916A00009	9/16/2021	2.25	9/16/2036	9/16/2021	114.25896	101.3255381	90.02517499	80.14129624	71.48712762	63.90146051	57.24503665	51.39745966	46.25455456
220124A00008	1/24/2022	1.88	1/22/2027	1/24/2022	105.82012	101.8015848	97.95794024	94.28064791	90.76163515	87.39326504	84.16831041	81.07992946	78.12164314
221110A00024	11/10/2022	4.51	11/10/2025	11/10/2022	111.08197	108.1536075	105.3189444	102.5744847	99.91687918	97.34292113	94.84953982	92.43379377	90.09286467
200311A00052	3/2/2021	1.43	2/28/2025	3/2/2021	101.36795	99.2483013	97.18302279	95.17033675	93.20853994	91.29599814	89.43114275	87.61246755	85.83852566
200207A00013	2/12/2020	1.73	2/10/2023	2/12/2020	100.14924	100.0328503	99.91673922	99.80091025	99.68536232	99.57009436	99.45510534	99.34039421	99.22595994

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200306A00064	3/6/2020	1.2	3/8/2027	3/6/2020	103.22569	99.13804564	95.23348841	91.50283656	87.93742013	84.52905109	81.26999362	78.15293635	75.17096649
200421A00032	4/21/2020	1.31	4/21/2027	4/21/2020	103.84054	99.62505167	95.60299142	91.76450652	88.10029684	84.60158141	81.26006663	78.06791669	75.01772583
200629A00023	6/29/2020	0.95	6/29/2026	6/29/2020	101.45754	98.06334452	94.79994377	91.66161895	88.64292889	85.73869876	82.94400552	80.25416421	77.66471517
210928A00009	9/28/2021	2.18	9/28/2033	9/28/2021	113.68046	103.2327096	93.85053308	85.41911472	77.83657241	71.01244396	64.86635382	59.32684141	54.33033105
220629A00002	6/29/2022	3.48	6/28/2024	6/29/2022	103.66167	102.1744558	100.7161798	99.28607488	97.88339665	96.50742651	95.15747044	93.83285796	92.53294115
220727A00004	7/27/2022	3.23	7/27/2027	7/27/2022	112.92653	108.2520165	103.8010193	99.56164505	95.52269408	91.6736196	88.00448615	84.50593079	81.16912697
220817A00037	10/14/2022	3.41	10/15/2027	10/14/2022	114.37113	109.4482322	104.7697353	100.3221877	96.09294756	92.07013229	88.24256916	84.5997489	81.13178271
201204A00015	12/8/2020	1.07	12/8/2025	12/8/2020	101.28438	98.42509036	95.66069252	92.98753869	90.40213949	87.90115841	85.48140426	83.13982397	80.87349586
221212A00041	12/12/2022	4.15	12/10/2027	12/12/2022	118.52113	113.3431838	108.4285037	103.762274	99.33059239	95.12040589	91.11945463	87.31621961	83.69987416
200327A00088	3/27/2020	1.22	3/27/2025	3/27/2020	100.99231	98.80474857	96.67481701	94.60057868	92.58017555	90.61182771	88.69382929	86.8245447	85.00240504
210525A00004	5/25/2021	1.02	12/19/2025	5/25/2021	101.16434	98.27782143	95.4880664	92.79131584	90.18397681	87.6626155	85.22394925	82.86483901	80.5822822
210907A00011	9/7/2021	2.65	9/6/2041	9/7/2021	117.878	101.0934705	87.0511449	75.28019141	65.39323538	57.07118104	50.05085762	44.11495275	39.0838008
211019A00009	10/19/2021	1.48	10/9/2026	10/19/2021	103.75195	100.0500512	96.4994293	93.09307386	89.82434409	86.68694394	83.67490201	80.78255269	78.00451869
220729A00043	7/29/2022	3.04	7/29/2027	7/29/2022	112.07442	107.4136816	102.9762762	98.75029695	94.72453751	90.88844572	87.23208191	83.74607993	80.42161097
220915A00040	9/15/2022	4.16	9/15/2025	9/15/2022	109.46433	106.7120502	104.043869	101.4566714	98.94748017	96.51344951	94.15185824	91.86010332	89.63569375
200331A00015	3/31/2020	0.64	3/31/2023	3/31/2020	99.995794	99.74436741	99.49420358	99.24529261	98.99762511	98.75119177	98.50598338	98.26199084	98.01920512
210119A00005	1/20/2021	0.52	9/25/2023	1/20/2021	99.532144	98.80197647	98.08245954	97.37336158	96.67445774	95.98552959	95.30636491	94.63675745	93.97650674
200304A00030	3/4/2020	1.6	12/22/2028	3/4/2020	106.34458	100.4894961	94.99254652	89.83002194	84.97990204	80.42172342	76.13646196	72.10642459	68.31514984
200629A00021	6/29/2020	1.21	6/29/2028	6/29/2020	104.11177	98.76797205	93.72864915	88.97493401	84.48922434	80.25508914	76.25718495	72.4811785	68.91367526
221118A00019	11/18/2022	4.55	11/18/2025	11/18/2022	111.29136	108.3384011	105.480557	102.7142475	100.0360511	97.4426934	94.93103941	92.49808721	90.14096137
200324A00051	3/24/2020	1.73	11/1/2024	3/24/2020	101.53339	99.72835342	97.96394574	96.23901917	94.55246716	92.90322103	91.29024836	89.7125516	88.16916663
210914A00014	9/14/2021	0.97	9/14/2026	9/14/2021	102.53337	98.89848648	95.41056101	92.06282733	88.8488771	85.76263426	82.79833558	79.95051247	77.21397395
220331A00011	3/31/2022	2.73	10/15/2024	3/31/2022	103.26244	101.4870342	99.75062103	98.05206267	96.39026125	94.76415992	93.17274101	91.6150242	90.09006477
220712A00016	7/15/2022	3.35	1/15/2026	7/15/2022	108.3323	105.2658479	102.3033015	99.44055154	96.67367737	93.99893575	91.41275188	88.91171066	86.49254862
221129A00035	11/29/2022	4.09	11/29/2027	11/29/2022	119.2388	114.0393284	109.1034281	104.4163208	99.96412937	95.73382155	91.71315437	87.89062225	84.25540888
200225A00028	2/25/2020	1.89	12/21/2029	2/25/2020	108.45908	101.6139116	95.24762396	89.32426447	83.8107549	78.67664609	73.89389659	69.43667097	65.28115592
200310A00034	3/10/2020	1.41	3/11/2030	3/10/2020	105.18678	98.2516798	91.81749791	85.84552846	80.30024973	75.14904393	70.3619454	65.91141189	61.77211676
211019A00011	10/19/2021	1.48	10/16/2026	10/19/2021	103.78302	100.0618274	96.49340167	93.07066652	89.78691105	86.63577085	83.61120806	80.70749271	77.91918525
200316A00046	3/16/2020	1.18	3/18/2024	3/16/2020	100.01751	98.82354151	97.65787847	96.51952878	95.40754184	94.32101069	93.25906956	92.22089152	91.20568634
200611A00019	6/11/2020	0.88	12/11/2025	6/11/2020	100.73126	97.87225713	95.10847103	92.43622283	89.85200107	87.35244864	84.9343551	82.5946494	80.330393
210310A00003	3/15/2021	0.79	8/26/2024	3/15/2021	99.695774	98.08385442	96.50534288	94.95926541	93.44468558	91.96070298	90.50645148	89.08109758	87.68383885
220225A00014	2/25/2022	2.42	2/23/2029	2/25/2022	111.39194	105.2219179	99.43591403	94.00798725	88.91408462	84.13189221	79.64070032	75.42127988	71.45576905
220901A00035	9/1/2022	3.82	9/1/2028	9/1/2022	118.87337	112.9546059	107.3750544	102.1133799	97.1497011	92.4654871	88.04345783	83.86749301	79.92254815

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200324A00013	3/25/2020	1.78	3/25/2025	3/25/2020	102.24104	100.0445876	97.90581125	95.82277434	93.79362247	91.81657892	89.8899407	88.01207474	86.18141439
201014A00002	10/14/2020	0.61	10/15/2024	10/14/2020	99.443944	97.70388772	96.00217462	94.3376821	92.70932976	91.11607762	89.55692422	88.03090487	86.53708993
220314A00004	3/14/2022	2.44	3/12/2027	3/14/2022	108.44201	104.2350026	100.2154993	96.37410453	92.70195078	89.19066377	85.83233179	82.61947734	79.54503061
200415A00033	4/15/2020	0.82	10/13/2023	4/15/2020	99.718961	98.94030273	98.17374339	97.41900269	96.67580897	95.94389886	95.22301694	94.51291545	93.813354
220830A00093	11/16/2022	3.69	11/16/2029	11/16/2022	120.72012	113.5512547	106.8692264	100.6382623	94.82540008	89.40024945	84.33477954	79.60312441	75.18140568
220912A00033	9/12/2022	3.9	10/7/2024	9/12/2022	105.28817	103.5159919	101.7822534	100.0858015	98.42553224	96.80038503	95.20934022	93.65141723	92.12567264
221207A00058	12/7/2022	4.01	12/7/2027	12/7/2022	117.80133	112.6493578	107.7591488	103.1159959	98.70609014	94.51646539	90.53494206	86.75007561	83.1511085
201105A00003	11/6/2020	2.24	11/4/2030	11/6/2020	111.83549	104.0656463	96.89635823	90.27805523	84.16549293	78.51735667	73.29590219	68.4666309	63.99799605
210907A00013	9/9/2021	2.14	9/9/2025	9/9/2021	103.94784	101.2867642	98.70715155	96.20598934	93.78039919	91.42762931	89.14504788	86.93013686	84.78048616
200317A00023	3/17/2020	1.1	3/17/2025	3/17/2020	101.15721	98.98525261	96.87012336	94.80992435	92.80283803	90.84712248	88.9411075	87.08319103	85.2718357
201015A00002	10/15/2020	0.61	10/15/2024	10/15/2020	99.443944	97.70388772	96.00217462	94.3376821	92.70932976	91.11607762	89.55692422	88.03090487	86.53708993
210920A00014	9/9/2022	1.28	9/9/2026	9/9/2022	102.8855	99.27784825	95.81504687	92.49046932	89.29783679	86.23119391	83.28488996	80.4535612	77.73211452
220114A00007	1/14/2022	1.7	1/27/2026	1/14/2022	103.35543	100.3339285	97.41626307	94.59827834	91.87601404	89.24569135	86.70370335	84.24660611	81.8711103
220119A00009	1/19/2022	1.35	1/19/2024	1/19/2022	100.17752	99.13742712	98.11881808	97.12102927	96.14342762	95.18540549	94.24637939	93.32578882	92.42309517
220804A00023	8/4/2022	3.19	8/4/2027	8/4/2022	112.80871	108.1151169	103.6468661	99.39191478	95.33893041	91.47724408	87.79680783	84.28815507	80.94236375
221107A00029	11/7/2022	4.83	11/9/2026	11/7/2022	116.81747	112.7823794	108.9127153	105.2008202	101.6394282	98.22164585	94.94093055	91.79107142	88.76617051
200730A00011	7/30/2020	1.15	7/28/2028	7/30/2020	103.78058	98.37049879	93.27254651	88.46714926	83.93606289	79.66227229	75.62990227	71.82413543	68.23113633
210928A00010	9/28/2021	1.12	9/26/2025	9/28/2021	101.23808	98.57019109	95.98536866	93.4804881	91.0525686	88.69876289	86.41635012	84.20272917	82.05541242
221213A00049	12/13/2022	4.01	12/13/2027	12/13/2022	117.85776	112.6876407	107.781028	103.1230669	98.69981574	94.49818584	90.50588545	86.71136701	83.10377832
221214A00102	12/14/2022	4.33	12/15/2025	12/14/2022	110.96282	107.9408574	105.0185907	102.1921761	99.45794458	96.81238837	94.25215322	91.77403064	89.37495071
221130A00033	11/30/2022	4.37	11/30/2027	11/30/2022	119.50405	114.3302829	109.417843	104.7521149	100.3193759	96.10673701	92.10208756	88.29404455	84.67190519
200228A00071	2/28/2020	1.74	12/14/2029	2/28/2020	107.4109	100.6190413	94.30181549	88.42365496	82.95182947	77.85620454	73.10902337	68.68470816	64.55967893
200304A00020	3/4/2020	0.98	3/4/2025	3/4/2020	100.85243	98.71883295	96.64037106	94.61523039	92.64167143	90.71802581	88.84269267	87.01413538	85.23087834
200325A00043	3/25/2020	1.62	6/25/2024	3/25/2020	100.8567	99.39914479	97.96985636	96.56808515	95.19310776	93.84422566	92.52076407	91.22207098	89.9475162
200409A00011	4/9/2020	0.7	4/7/2023	4/9/2020	100.00767	99.73700705	99.46781867	99.20009203	98.93381515	98.66897617	98.40556339	98.14356523	97.88297021
210108A00008	1/11/2021	0.51	8/15/2023	1/11/2021	99.640885	99.01955326	98.40594013	97.79990229	97.2013001	96.6099973	96.02586096	95.44876135	94.87857187
210917A00004	9/17/2021	1.03	9/17/2025	9/17/2021	100.97045	98.32937086	95.76996276	93.28917948	90.88411121	88.55197727	86.29011938	84.0959952	81.9671724
220921A00050	9/21/2022	4.51	4/29/2024	9/21/2022	104.56879	103.2354877	101.9258513	100.6392945	99.37525278	98.13317994	96.91254704	95.71284187	94.5335682
221202A00018	12/2/2022	4.16	12/2/2027	12/2/2022	118.49202	113.3372295	108.4434188	103.7959695	99.38115478	95.18608271	91.19864118	87.40744685	83.80179768
200323A00018	3/23/2020	1.37	3/23/2023	3/23/2020	100.12633	99.89718051	99.66908142	99.44202939	99.2160172	98.9910377	98.76708383	98.54414856	98.32222496
200401A00012	4/2/2020	1	4/2/2025	4/2/2020	100.51152	98.31371482	96.1741947	94.09100235	92.06225873	90.08616334	88.16099014	86.28508384	84.45685629
200423A00026	4/28/2020	0.85	12/15/2023	4/28/2020	99.676641	98.73145228	97.80407663	96.89401471	96.00078541	95.12392532	94.26298791	93.41754273	92.58717476
210324A00003	3/24/2021	1.18	3/24/2026	3/24/2021	101.94787	98.79677034	95.75855417	92.82851138	90.00215637	87.27521972	84.64363615	82.10353324	79.65122085

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210526A00018	5/26/2021	1.11	5/26/2026	5/26/2021	101.91539	98.60029691	95.40968129	92.33824117	89.38092446	86.53291973	83.78964341	81.1467278	78.60000975
220824A00008	8/24/2022	3.62	8/24/2023	8/24/2022	101.65428	101.0014931	100.3570928	99.72091874	99.09281401	98.47262568	97.86020464	97.25540551	96.65808652
221121A00064	11/21/2022	4.34	11/22/2027	11/21/2022	119.27422	114.1279244	109.2405915	104.5977962	100.1859885	95.99243826	92.00518133	88.21296947	84.60522407
200221A00011	2/21/2020	1.69	8/21/2024	2/21/2020	101.1591	99.54791517	97.96991204	96.42412746	94.90963786	93.42555491	91.97102379	90.54522164	89.14735602
200221A00024	2/21/2020	2.05	12/28/2029	2/21/2020	109.58233	102.6811261	96.26319468	90.29219399	84.73468834	79.55990518	74.73951037	70.24740342	66.05953088
200306A00003	3/6/2020	0.7	3/6/2023	3/6/2020	100.03341	99.85071371	99.66869784	99.48735406	99.30667861	99.12666774	98.94731774	98.76862492	98.59058562
200309A00030	3/9/2020	1.11	3/9/2027	3/9/2020	102.85225	98.76972981	94.87026769	91.14467543	87.58427759	84.18088136	80.92674674	77.81455874	74.83740148
200415A00021	4/15/2020	1.37	4/15/2027	4/15/2020	104.07808	99.87298156	95.86010558	92.02967449	88.37245749	84.87974032	81.54329345	78.35534236	75.3085399
200521A00017	5/21/2020	2.22	5/21/2038	5/21/2020	113.22991	99.09131706	86.92814626	76.45118855	67.41501598	59.61116363	52.86239921	47.01790479	41.94922187
210218A00006	2/18/2021	0.5	2/20/2024	2/18/2021	99.210344	98.09222328	96.99908307	95.93009496	94.88446641	93.86143921	92.86028763	91.8803167	90.92086062
221129A00072	11/29/2022	4.39	12/2/2026	11/29/2022	115.39567	111.3250936	107.4241697	103.6849211	100.099787	96.66159974	93.36356263	90.19922854	87.16248017
201117A00006	11/17/2020	0.57	11/17/2023	11/17/2020	99.448282	98.57821885	97.72328286	96.88308251	96.05723956	95.24538865	94.44717671	93.66226245	92.89031591
210712A00008	6/27/2022	1.05	6/27/2025	6/27/2022	100.82115	98.3959639	96.04116878	93.75432527	91.53309128	89.37521987	87.2785548	85.24102623	83.26064672
211129A00012	11/29/2021	1.53	11/25/2026	11/29/2021	104.14634	100.313729	96.64252726	93.12511982	89.75429437	86.52321359	83.42539369	80.45468425	77.60524942
220106A00008	1/6/2022	2.5	1/5/2035	1/6/2022	117.47759	105.7356479	95.30895805	86.04200498	77.79844035	70.45863088	63.91753288	58.08284638	52.87341076
220323A00016	6/2/2022	2.78	6/2/2025	6/2/2022	104.96916	102.5569594	100.2126359	97.93390057	95.71855614	93.56449204	91.46968047	89.4321726	87.45009503
221122A00040	11/22/2022	4.31	11/22/2027	11/22/2022	119.1275	113.9847487	109.100835	104.4613345	100.0527027	95.86221486	91.87791179	88.08855003	84.48355551
200327A00059	3/27/2020	1.01	3/27/2024	3/27/2020	99.81078	98.59460646	97.4078352	96.24941128	95.11832966	94.01363227	92.93440533	91.8797768	90.848914
201116A00025	11/18/2020	1.96	11/15/2032	11/18/2020	111.20142	101.6326212	92.97279884	85.13066736	78.0245429	71.58128717	65.73537533	60.42806958	55.60668594
211221A00010	12/21/2021	1.31	12/20/2024	12/21/2021	100.88099	98.95421776	97.0737242	95.23811893	93.44605949	91.69625268	89.98745241	88.31845761	86.68811031
220510A00016	5/13/2022	3.23	5/5/2027	5/13/2022	112.22576	107.7930994	103.5631391	99.52556943	95.67065307	91.98919403	88.47250504	85.11237692	81.90104983
220527A00015	5/27/2022	3.03	5/27/2027	5/27/2022	111.53582	107.0576285	102.7870719	98.71344168	94.82663901	91.11713414	87.57593149	84.19453699	80.9649276
221024A00018	10/24/2022	4.91	10/24/2024	10/24/2022	107.30571	105.467919	103.6708536	101.9133488	100.1942832	98.51257542	96.86718208	95.25709621	93.6813457
200310A00005	3/10/2020	1.41	3/8/2030	3/10/2020	105.18448	98.25696898	91.82931384	85.86293629	80.32242161	75.17524731	70.39153257	65.94381076	61.80682257
200327A00037	3/27/2020	1.18	3/27/2026	3/27/2020	102.63892	99.45181906	96.37940048	93.41685651	90.55961008	87.80330587	85.14379781	82.57713753	80.0995634
200406A00049	4/6/2020	0.92	4/6/2023	4/6/2020	100.01665	99.74926327	99.48331097	99.21878104	98.95566204	98.69394267	98.43361174	98.17465819	97.91707107
200429A00021	5/4/2020	0.97	4/29/2025	5/4/2020	100.49706	98.229728	96.02425839	93.87863381	91.79091332	89.75923	87.78178767	85.8568578	83.98277655
201019A00006	10/19/2020	0.57	10/19/2023	10/19/2020	99.515292	98.72151109	97.94031966	97.17142036	96.41452498	95.66935422	94.93563743	94.2131122	93.5015241
210225A00012	3/1/2021	0.91	8/25/2025	3/1/2021	100.59878	98.0218059	95.52312103	93.09986011	90.74928595	88.46877999	86.25583619	84.10805534	82.02313971
220204A00004	2/4/2022	2.08	1/8/2027	2/4/2022	106.5515	102.5549184	98.73083402	95.07089635	91.56720126	88.21226759	84.99901218	81.92072655	78.971055
220823A00032	8/23/2022	3.6	8/23/2023	8/23/2022	101.63562	100.9855957	100.3438918	99.71034759	99.08480812	98.46712217	97.85714239	97.25472507	96.65973006
220921A00074	9/21/2022	3.98	9/21/2027	9/21/2022	117.98526	113.0095653	108.277668	103.7762347	99.49274029	95.41541233	91.53318133	87.83563459	84.31297327
221229A00043	12/29/2022	4.96	7/1/2024	12/29/2022	105.92355	104.4105915	102.9271661	101.4724811	100.0457732	98.64630595	97.27336795	95.92627223	94.60435502

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221208A00110	12/8/2022	4.07	12/8/2027	12/8/2022	118.1068	112.9445778	108.0446771	103.3923532	98.97376351	94.77591062	90.7865859	86.99431785	83.38832385
211117A00010	11/17/2021	1.18	11/18/2024	11/17/2021	100.5405	98.70130332	96.90445877	95.14874564	93.43298524	91.7560402	90.1168127	88.51424287	86.94730718
221129A00062	11/29/2022	4.39	11/27/2026	11/29/2022	115.33521	111.2795886	107.3924606	103.6659311	100.0925135	96.66510923	93.37698578	90.2217559	87.19335802
200605A00014	6/5/2020	1.02	6/5/2025	6/5/2020	100.65144	98.37777003	96.16797917	94.01990815	91.93148632	89.90072499	87.92571367	86.00461652	84.13566892
200605A00016	6/5/2020	1.02	6/5/2025	6/5/2020	100.65144	98.37777003	96.16797917	94.01990815	91.93148632	89.90072499	87.92571367	86.00461652	84.13566891
200605A00017	6/5/2020	1.02	6/5/2025	6/5/2020	100.65144	98.37777004	96.16797921	94.01990821	91.93148641	89.9007251	87.92571381	86.00461667	84.13566909
200709A00021	7/9/2020	0.83	7/9/2025	7/9/2020	100.2592	97.91177884	95.63247688	93.41890975	91.26879605	89.17994819	87.15026787	85.17774186	83.26043791
200709A00025	7/9/2020	1.37	7/9/2030	7/9/2020	104.4918	98.10367874	92.1764118	86.67383401	81.56281459	76.81298455	72.39649259	68.28778384	64.46339904
200813A00019	8/13/2020	1.44	8/13/2030	8/13/2020	104.99003	98.50847158	92.49918993	86.92475636	81.75091334	76.94628781	72.48213358	68.33209797	64.47201037
200813A00020	8/13/2020	1.44	8/13/2030	8/13/2020	104.99003	98.50847156	92.49918999	86.92475648	81.75091352	76.94628805	72.48213387	68.3320983	64.47201075
200813A00023	8/13/2020	0.86	10/14/2025	8/13/2020	100.50538	97.92369674	95.42275747	92.99955007	90.65119872	88.37495293	86.16818114	84.02836473	81.95309237
200911A00011	9/11/2020	1.18	9/11/2030	9/11/2020	103.2515	96.80149052	90.82608056	85.28731862	80.15049265	75.3838397	70.95828004	66.84717659	63.02611721
200911A00012	9/11/2020	1.18	9/11/2030	9/11/2020	103.25107	96.80211814	90.82766033	85.28975569	80.15370075	75.38774034	70.96280181	66.85225452	63.03169221
200911A00013	9/11/2020	0.69	9/11/2025	9/11/2020	100.00726	97.51269589	95.0940825	92.74861976	90.47362803	88.26654556	86.12492226	84.046414	82.02877711
201007A00008	10/7/2020	1.22	10/7/2030	10/7/2020	103.43705	97.15220105	91.32688722	85.92437673	80.91108066	76.25626824	71.93180859	67.91193704	64.17304381
201007A00010	10/7/2020	1.22	10/7/2030	10/7/2020	103.43705	97.15220105	91.32688722	85.92437673	80.91108066	76.25626824	71.93180859	67.91193704	64.17304381
201007A00014	10/7/2020	0.8	10/7/2025	10/7/2020	100.32162	97.78921603	95.33529639	92.95692717	90.65130936	88.41576757	86.24774353	84.14479014	82.10456568
201015A00020	10/15/2020	0.94	10/15/2027	10/15/2020	102.26843	97.98426497	93.91101967	90.03713339	86.35174041	82.84462613	79.5061845	76.32737837	73.29970271
201109A00012	11/9/2020	1.39	11/8/2030	11/9/2020	104.71772	98.08130763	91.94133712	86.25750614	80.99299965	76.11416809	71.59023981	67.39306095	63.49686011
201211A00001	12/11/2020	0.95	12/11/2030	12/11/2020	102.98364	96.92794204	91.31448786	86.1076659	81.27493776	76.78656069	72.61533262	68.7363618	65.12685841
210107A00007	1/7/2021	0.84	1/7/2026	1/7/2021	100.59904	97.81391528	95.12232332	92.52059749	90.00523277	87.57288167	85.22034615	82.94457002	80.74263175
210201A00002	2/1/2021	1.19	2/1/2036	2/1/2021	102.60957	96.28404027	90.50555846	85.21926956	80.37635889	75.93334096	71.85143505	68.09601814	64.63614534
210809A00010	8/9/2021	1.06	8/7/2026	8/9/2021	101.77244	98.50795788	95.36951828	92.35152605	89.44867025	86.6559057	83.96843804	81.38170964	78.8913865
210915A00027	9/15/2021	1.1	9/15/2026	9/15/2021	102.01488	98.65780567	95.43329864	92.33533275	89.35819691	86.49647368	83.74502214	81.09896195	78.55365839
210921A00006	9/21/2021	1.43	9/21/2028	9/21/2021	104.86131	99.73580458	94.90381659	90.3468179	86.04755386	81.98994803	78.15901514	74.54078095	71.12220846
210921A00009	9/21/2021	1.28	9/21/2028	9/21/2021	105.23267	100.065441	95.19503957	90.60267558	86.27085427	82.18327882	78.32476154	74.6811422	71.23921281
211007A00006	10/7/2021	1.28	10/7/2026	10/7/2021	102.7126	99.28760056	95.99960663	92.8423342	89.80982707	86.89643684	84.096805	81.40584616	78.81873237
211014A00012	10/14/2021	1.46	10/14/2031	10/14/2021	104.71392	100.2662293	96.09029697	92.16654113	88.47695487	85.00496845	81.73532434	78.65396391	75.74792462
211110A00012	11/10/2021	1.44	11/10/2026	11/10/2021	103.4041	99.8834536	96.50665685	93.26705321	90.15833302	87.17450975	84.3099017	81.55911494	78.9170272
211110A00013	11/10/2021	1.44	11/10/2026	11/10/2021	103.4041	99.88345366	96.50665669	93.26705285	90.15833247	87.17450902	84.3099008	81.55911387	78.91702598
211110A00014	11/10/2021	1.44	11/10/2026	11/10/2021	103.4041	99.8834535	96.50665717	93.26705392	90.15833411	87.17451119	84.30990348	81.55911703	78.91702959
211208A00012	12/8/2021	1.62	12/8/2026	12/8/2021	104.16897	100.5647026	97.1102269	93.79849039	90.6228135	87.57686497	84.65464186	81.85045071	79.15888992
220111A00005	1/11/2022	1.54	1/10/2025	1/11/2022	101.34779	99.43233969	97.56354761	95.73997413	93.96023563	92.22300082	90.52698831	88.87096439	87.25374086

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220411A00008	4/11/2022	3.02	4/12/2027	4/11/2022	111.24153	107.1286829	103.1986298	99.44218528	95.85067714	92.41591609	89.13016604	85.98611632	82.97685583
220520A00006	5/20/2022	3.02	5/20/2027	5/20/2022	111.21345	107.1099249	103.1911793	99.44783094	95.87102415	92.45239763	89.18405429	86.058533	83.0687823
220617A00030	6/17/2022	3.43	6/17/2025	6/17/2022	103.17952	101.9112039	100.6709579	99.45792657	98.27128925	97.11025675	95.97406995	94.86199839	93.77333892
220617A00061	6/17/2022	3.26	6/17/2024	6/17/2022	101.64083	100.886378	100.1450001	99.41633982	98.70005514	97.99581658	97.30330676	96.62221984	95.95226099
220916A00018	9/16/2022	4.07	9/16/2027	9/16/2022	114.98039	110.6973615	106.6145587	102.7213299	99.00765153	95.46409074	92.08176715	88.85231704	85.76786017
220919A00036	9/19/2022	4.11	9/19/2029	9/19/2022	121.73891	115.1063284	108.9043542	103.1022966	97.6718213	92.58676005	87.82293295	83.3579868	79.17124732
221017A00055	10/17/2022	4.88	11/18/2024	10/17/2022	103.75751	102.7753334	101.8118278	100.8664665	99.93874624	99.0281824	98.13430818	97.25667375	96.39484545
221123A00016	11/23/2022	4.58	11/23/2029	11/23/2022	125.29105	118.3540585	111.8766426	105.8254398	100.1696882	94.88101026	89.93321643	85.30212553	80.9654008
221201A00068	12/1/2022	4.21	12/1/2027	12/1/2022	116.27648	111.7724955	107.4868274	103.4075193	99.52333919	95.82372871	92.29875894	88.9390897	85.73593151
221222A00053	12/22/2022	4.18	12/22/2027	12/22/2022	117.07556	112.3080297	107.7777056	103.4713503	99.37653776	95.48159906	91.77557258	88.24815717	84.88966895
210603A00008	6/3/2021	1.74	6/3/2036	6/3/2021	107.67295	101.0699681	95.04320379	89.53405882	84.49049306	79.86623928	75.62011506	71.71542153	68.11941747
220722A00036	7/22/2022	3.34	7/22/2025	7/22/2022	103.13613	101.8453665	100.5836688	99.35014549	98.14393562	96.96421172	95.81017809	94.68106934	93.57614899
220916A00021	9/16/2022	4.17	9/16/2027	9/16/2022	108.43306	105.9997711	103.6524962	101.3874499	99.20104112	97.0898625	95.05067952	93.08042067	91.17616803
050902A00032	9/2/2005	4.69	8/22/2025	9/2/2005	111.18823	108.4647933	105.8231095	103.2602091	100.773249	98.35950888	96.01638492	93.74138392	91.53211774
050923A00096	9/23/2005	4.86	9/22/2025	9/23/2005	112.05437	109.2344588	106.5012037	103.8513679	101.2818626	98.78973642	96.3721686	94.02646175	91.75003562
051003A00009	10/3/2005	5.15	10/15/2025	10/3/2005	112.56218	109.6844637	106.8966098	104.1952737	101.5772594	99.03950967	96.57909916	94.19322778	91.87921444
051107A00075	11/7/2005	5.29	11/17/2025	11/7/2005	114.0561	111.0512433	108.1430743	105.3279566	102.60241	99.96310412	97.40685054	94.9305964	92.53141769
060308A00014	3/8/2006	5.44	3/16/2026	3/8/2006	115.60118	112.2514878	109.0190742	105.8991099	102.8869989	99.97836406	97.16903507	94.45503705	91.83258003
060808A00022	8/8/2006	5.57	6/15/2026	8/8/2006	117.40443	113.7699491	110.2712421	106.9024916	103.6581574	100.5329662	97.52189739	94.62016895	91.82322526
080909A00042	9/9/2008	4.74	9/11/2023	9/9/2008	102.68091	101.9738894	101.2766384	100.5889555	99.91064423	99.24151358	98.58137761	97.93005542	97.28737093
080910A00065	9/10/2008	5.03	9/15/2023	9/10/2008	102.79127	102.0747157	101.3681874	100.6714766	99.98437915	99.30669665	98.63823612	97.9788098	97.32823503
081205A00033	12/5/2008	4.77	12/7/2023	12/5/2008	103.37862	102.4357963	101.5102335	100.6014627	99.70902911	98.83249424	97.97143522	97.12544404	96.29412697
081209A00008	12/9/2008	4.87	12/15/2023	12/9/2008	103.56301	102.5975971	101.6502637	100.7205045	99.80783274	98.91177945	98.03189277	97.16773709	96.31889237
081211A00029	12/11/2008	4.57	12/15/2023	12/11/2008	103.27298	102.3090788	101.3632348	100.4349456	99.52372473	98.62910377	97.75063121	96.88787184	96.04040598
081215A00091	12/15/2008	4.19	12/15/2023	12/15/2008	103.08793	102.1224198	101.1750423	100.2452914	99.33267785	98.43673014	97.55699407	96.69303179	95.8444211
081217A00076	12/17/2008	3.86	12/22/2023	12/17/2008	102.82336	101.8404334	100.8763267	99.93050678	99.00245648	98.09167782	97.19769133	96.32003517	95.45826428
081219A00069	12/19/2008	4.26	12/22/2023	12/19/2008	103.03203	102.0506305	101.0879788	100.1435409	99.21680262	98.30726909	97.4144637	96.53792733	95.67721753
090226A00006	2/26/2009	4.55	3/1/2024	2/26/2009	104.19978	103.020952	101.8689022	100.7427235	99.6415501	98.56455488	97.51094665	96.47996846	95.47089575
091112A00011	11/12/2009	4.77	11/15/2024	11/12/2009	107.70645	105.7983795	103.9339145	102.1118037	100.3308361	98.58984291	96.88769635	95.22330744	93.59562464
091210A00005	12/10/2009	5.08	12/16/2024	12/10/2009	108.29688	106.3060122	104.3623631	102.4645211	100.6111263	98.80086837	97.03248435	95.30475681	93.61651172
100809A00029	8/9/2010	4.23	8/15/2025	8/9/2010	109.31252	106.6454942	104.0580308	101.5472626	99.11044258	96.74494138	94.44824106	92.21792972	90.05169621
100824A00009	8/24/2010	3.91	9/2/2025	8/24/2010	108.65375	105.9473073	103.3227885	100.7771911	98.3076448	95.91140425	93.58584274	91.32844614	89.1368072
100930A00008	9/30/2010	3.82	9/30/2025	9/30/2010	108.68956	105.9078824	103.2122965	100.5995687	98.06661281	95.61048109	93.22835683	90.91754737	88.67547768

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
110505A00022	5/5/2011	4.59	5/15/2026	5/5/2011	113.62406	110.1402729	106.7842607	103.5506573	100.4343518	97.43047426	94.53438225	91.74164954	89.04805464
110805A00014	8/5/2011	4.06	8/17/2026	8/5/2011	112.89583	109.1659349	105.5818032	102.1369045	98.82504363	95.6403378	92.57719936	89.63031894	86.79464987
110824A00004	8/24/2011	3.11	8/30/2023	8/24/2011	101.47096	100.8010843	100.1400382	99.48765212	98.84375686	98.20818744	97.58078315	96.96138743	96.34984766
111006A00023	10/6/2011	3.81	10/15/2026	10/6/2011	112.61391	108.7284172	105.0004714	101.4228154	97.9885669	94.69119791	91.52451467	88.48263833	85.55998712
111024A00010	10/24/2011	3.11	10/30/2023	10/24/2011	101.78374	100.9483042	100.1265655	99.31819195	98.52285948	97.74025437	96.97007292	96.21202102	95.46581376
111024A00022	10/24/2011	3.11	10/30/2023	10/24/2011	101.78374	100.9483042	100.1265655	99.31819195	98.52285948	97.74025437	96.97007292	96.21202102	95.46581376
111024A00027	10/24/2011	3.11	10/30/2023	10/24/2011	101.78374	100.9483042	100.1265655	99.31819195	98.52285948	97.74025437	96.97007292	96.21202102	95.46581376
111216A00001	12/16/2011	3.95	12/30/2031	12/16/2011	128.32085	118.7875202	110.0691557	102.090989	94.78549753	88.09166938	81.95434424	76.32362409	71.15434593
120112A00013	1/12/2012	2.76	1/16/2024	1/12/2012	101.86021	100.8156705	99.7925287	98.79013111	97.80785126	96.84508767	95.90126265	94.97582111	94.06822948
120112A00014	1/12/2012	3.43	1/15/2032	1/12/2012	125.97147	116.3942997	107.6461057	99.65011342	92.33705021	85.64437803	79.51560646	73.89967892	68.75042402
120113A00012	1/13/2012	3.62	1/15/2027	1/13/2012	112.81805	108.677036	104.7139095	100.9200606	97.28734236	93.80804473	90.47486845	87.28090095	84.21959366
120113A00013	1/13/2012	3.87	1/15/2032	1/13/2012	127.72397	118.1743384	109.4450232	101.460438	94.15235475	87.45915121	81.32513917	75.69996457	70.53807087
120127A00018	1/27/2012	3.64	2/1/2027	1/27/2012	113.07064	108.8781807	104.8673748	101.0293495	97.35571689	93.83854329	90.47032182	87.24394709	84.15269136
120127A00019	1/27/2012	3.87	1/30/2032	1/27/2012	127.82946	118.2357809	109.4692398	101.453353	94.11910567	87.40418868	81.25231405	75.61260408	70.43904513
120306A00004	3/6/2012	2.95	3/15/2023	3/6/2012	100.45204	100.2443727	100.0375758	99.83164346	99.62657017	99.42235051	99.2189791	99.01645064	98.81475982
120312A00009	3/12/2012	2.72	3/15/2024	3/12/2012	102.1169	100.9138219	99.73904806	98.59158526	97.47048904	96.37485803	95.30383156	94.25658735	93.23233942
120411A00013	4/11/2012	3.59	4/15/2027	4/11/2012	113.5983	109.1904346	104.9814774	100.9613738	97.12063032	93.45028262	89.94186316	86.58737077	83.37924233
120517A00007	5/17/2012	2.42	5/31/2023	5/17/2012	100.70671	100.2865164	99.86982125	99.45658315	99.04675923	98.6403073	98.2371859	97.8373542	97.44077208
120709A00016	7/9/2012	3.2	7/15/2027	7/9/2012	112.68789	108.0520236	103.6366057	99.42996845	95.4211236	91.59971947	87.95600085	84.48077129	81.16535815
121116A00006	11/16/2012	2.64	11/13/2025	11/16/2012	105.73899	102.879888	100.1131086	97.43518516	94.84280103	92.33278122	89.90208577	87.54780323	85.26714448
121116A00021	11/16/2012	2.35	11/17/2025	11/16/2012	105.5423	102.6615158	99.87438686	97.17737645	94.56709925	92.0403157	89.59392493	87.22495797	84.93057143
121116A00022	11/16/2012	2.78	11/16/2029	11/16/2012	116.09036	109.0131133	102.4216888	96.28014702	90.55538583	85.21689962	80.23656347	75.58843612	71.24858028
130107A00002	1/7/2013	3.22	1/18/2028	1/7/2013	114.14962	108.9743103	104.0686116	99.41702876	95.00503601	90.81901367	86.84618706	83.07456961	79.49291009
130211A00017	2/11/2013	3.27	2/15/2028	2/11/2013	114.59673	109.33382	104.3483718	99.62424079	95.14631225	90.90042662	86.87331393	83.05253301	79.42641532
130212A00017	2/12/2013	2.29	2/15/2023	2/12/2013	100.23075	100.100476	99.97055326	99.84098055	99.71175644	99.58287948	99.45434826	99.32616134	99.19831734
130314A00027	3/14/2013	2.38	3/15/2023	3/14/2013	100.37492	100.1669299	99.95982002	99.75358093	99.54820707	99.34369292	99.140033	98.9372219	98.73525422
130405A00006	4/5/2013	2.41	4/7/2025	4/5/2013	104.21145	101.9482716	99.74536308	97.60070969	95.51237746	93.47851209	91.49733495	89.56713926	87.68628658
130405A00007	4/5/2013	2.91	4/17/2028	4/5/2013	114.32759	108.8617471	103.6937447	98.80577088	94.18116928	89.80436042	85.66076638	81.73674116	78.01950637
130424A00004	4/24/2013	2.46	4/24/2025	4/24/2013	104.43825	102.1273711	99.87912658	97.69145594	95.56238291	93.49000814	91.47250563	89.50811945	87.59516054
130424A00005	4/24/2013	3.07	4/24/2030	4/24/2013	118.98052	111.3750128	104.3189712	97.76968448	91.68797195	86.03787549	80.78637929	75.90315508	71.36033068
130508A00013	5/8/2013	2.23	5/15/2023	5/8/2013	100.56688	100.1908333	99.81761282	99.44718235	99.0795105	98.71456638	98.35231958	97.99274015	97.63579856
130513A00007	5/13/2013	2.54	5/15/2023	5/13/2013	100.61289	100.2375485	99.86501097	99.49524837	99.12822973	98.76392449	98.40230256	98.04333429	97.68699045
130528A00028	5/28/2013	2.63	5/30/2023	5/28/2013	100.71607	100.2994439	99.88625813	99.47646546	99.07002431	98.66689379	98.26703365	97.8704043	97.47696678

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
130531A00021	5/31/2013	3.22	5/30/2028	5/31/2013	116.25542	110.6200674	105.2973198	100.2681776	95.51489251	91.02087796	86.77062738	82.74963848	78.94434328
130606A00013	6/6/2013	2.94	6/15/2023	6/6/2013	100.91924	100.4585081	100.0019902	99.54962686	99.10136152	98.65713851	98.21690319	97.78060194	97.34818205
130702A00018	7/2/2013	3.17	7/17/2023	7/2/2013	101.29218	100.7421022	100.1980072	99.65979721	99.12737699	98.60065326	98.07953474	97.56393211	97.05375793
130712A00005	7/12/2013	3.25	7/17/2023	7/12/2013	101.3363	100.7860842	100.2418502	99.70350232	99.17094528	98.64408577	98.12283252	97.60709619	97.09678932
130821A00019	8/21/2013	3.81	8/29/2025	8/21/2013	108.92346	106.2115178	103.5816379	101.0308112	98.55616499	96.15495156	93.82454179	91.56241904	89.36617352
130904A00036	9/4/2013	3.57	9/15/2023	9/4/2013	101.87949	101.1648164	100.4601863	99.76538555	99.08020915	98.4044578	97.73793765	97.08046018	96.43184194
130904A00039	9/4/2013	4.19	9/15/2028	9/4/2013	122.44817	116.3440888	110.5917408	105.168853	100.054683	95.22990764	90.67651824	86.37772362	82.31786125
130926A00009	9/26/2013	4	10/2/2028	9/26/2013	121.48752	115.3635324	109.5953474	104.1602721	99.03718281	94.20641088	89.6496344	85.34977854	81.29092384
131106A00003	11/6/2013	3.57	11/15/2023	11/6/2013	102.10518	101.2276441	100.3652043	99.51747652	98.68408606	97.864671	97.05888151	96.26637934	95.48683739
131217A00023	12/17/2013	3.74	1/2/2024	12/17/2013	102.59641	101.5879502	100.5993339	99.62998342	98.67933926	97.74686327	96.8320378	95.9343647	95.05336443
131217A00024	12/17/2013	4.34	1/2/2029	12/17/2013	122.76256	116.3954598	110.4109841	104.7839782	99.49107176	94.51054296	89.82219377	85.40723554	81.24818358
140113A00012	1/13/2014	3.48	1/17/2023	1/13/2014	100.16249	100.1124669	100.0625068	100.0126138	99.96278756	99.91302807	99.86333515	99.81370868	99.7641485
140131A00025	1/31/2014	3.28	1/30/2023	1/31/2014	100.26263	100.1765124	100.0905385	100.0047107	99.91902876	99.83349229	99.74810091	99.66285429	99.57775205
140307A00011	3/7/2014	3.19	3/15/2023	3/7/2014	100.54355	100.3353129	100.1279516	99.92146187	99.71583821	99.51107509	99.30716702	99.10410857	98.90189437
140313A00030	3/13/2014	3.27	3/15/2024	3/13/2014	102.7866	101.5792191	100.4002069	99.24857456	98.12337558	97.02370686	95.94870599	94.89754904	93.86944844
140423A00036	4/23/2014	4.03	4/23/2029	4/23/2014	121.65351	115.0122012	108.7881551	102.9528331	97.47979398	92.34452892	87.52431038	82.99805416	78.74619254
140521A00019	5/21/2014	3.43	5/22/2028	5/21/2014	117.34103	111.6989938	106.3683031	101.3301174	96.56683362	92.0619961	87.8002162	83.76709776	79.94916827
140626A00036	6/26/2014	3.55	6/26/2029	6/26/2014	120.50875	113.6723066	107.2790262	101.2977246	95.69956797	90.45788628	85.5480006	80.94706445	76.63391892
140710A00027	7/10/2014	2.8	7/17/2023	7/10/2014	101.08812	100.5386855	99.99523326	99.45766106	98.92587367	98.39977788	97.8792825	97.36429825	96.85473776
140815A00030	8/15/2014	2.96	10/16/2023	8/15/2014	101.43837	100.6440809	99.86222858	99.0925196	98.33467239	97.58841403	96.85347996	96.12961362	95.41656613
140815A00032	8/15/2014	3.59	10/15/2029	8/15/2014	119.85057	112.7961207	106.2156907	100.0747741	94.34155659	88.9866889	83.98308376	79.30573023	74.93152422
140827A00038	8/27/2014	3.07	8/30/2024	8/27/2014	103.50424	101.8493389	100.2287868	98.6415735	97.08673261	95.56333496	94.07048697	92.60732892	91.1730333
140911A00027	9/11/2014	3.18	9/16/2024	9/11/2014	103.82193	102.1194524	100.4530001	98.82149257	97.22389327	95.65920696	94.12647757	92.62478618	91.15324925
140922A00026	9/22/2014	3.02	9/30/2024	9/22/2014	104.01962	102.2719677	100.5619891	98.88853362	97.25049625	95.64681695	94.07647838	92.53850372	91.03195454
141208A00008	12/8/2014	3.02	12/16/2024	12/8/2014	104.23806	102.2880937	100.384562	98.52607197	96.71128484	94.93891087	93.20770702	91.51647491	89.86405894
150105A00026	1/5/2015	2.54	1/5/2024	1/5/2015	101.5802	100.5665337	99.57305959	98.59917573	97.64430678	96.7078998	95.78942308	94.88836519	94.00423396
150220A00021	2/20/2015	2.72	2/20/2024	2/20/2015	101.76419	100.6304967	99.5220214	98.43793362	97.3774348	96.33976092	95.32418065	94.32999361	93.35652877
150220A00022	2/20/2015	2.8	2/20/2025	2/20/2015	104.28273	102.153346	100.0779979	98.05494255	96.08250343	94.15907108	92.28309994	90.45310526	88.66766013
150316A00043	3/16/2015	2.37	3/16/2023	3/16/2015	100.37655	100.1658034	99.95595673	99.74700358	99.53893811	99.3317546	99.12544735	98.92001074	98.71543919
150317A00012	3/17/2015	2.46	3/18/2024	3/17/2015	101.81427	100.6051778	99.42473192	98.27192027	97.14578084	96.04539582	94.96988913	93.91842401	92.89020086
150317A00013	3/17/2015	2.58	3/17/2025	3/17/2015	104.44871	102.2395112	100.087904	97.99197159	95.94987492	93.9598512	92.02021025	90.12933075	88.28565677
150319A00012	3/19/2015	3.13	3/19/2029	3/19/2015	115.85038	109.4807801	103.5089434	97.90783682	92.65240781	87.71942897	83.08735541	78.73619393	74.64738308
150319A00013	3/19/2015	3.25	3/19/2030	3/19/2015	118.37649	110.9579266	104.0667441	97.66247775	91.70797689	86.16911792	81.01454211	76.21541753	71.74522264

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150401A00008	4/1/2015	2.62	4/1/2025	4/1/2015	104.17006	101.9328295	99.75463319	97.63348233	95.56747535	93.55479031	91.59368077	89.682472	87.81955733
150407A00010	4/7/2015	2.21	4/10/2023	4/7/2015	100.42948	100.1498049	99.87170227	99.59515637	99.320154	99.04668214	98.77472793	98.50427865	98.23532172
150408A00004	4/8/2015	2.17	4/10/2023	4/8/2015	100.41827	100.1386146	99.86053261	99.58400721	99.30902524	99.03557371	98.76363973	98.4932106	98.22427373
150422A00019	4/22/2015	2.62	4/22/2025	4/22/2015	104.30614	102.0120672	99.77986158	97.60749631	95.49302043	93.43455922	91.43031062	89.47854194	87.57758669
150512A00029	5/12/2015	3.03	5/12/2025	5/12/2015	105.4116	103.0507319	100.7548079	98.52169176	96.34932552	94.23573066	92.1790044	90.17731638	88.22890548
150519A00013	5/19/2015	2.98	5/19/2025	5/19/2015	105.34733	102.9682153	100.6550373	98.40561063	96.21783116	94.08967629	92.01920152	90.00453694	88.04388393
150601A00404	6/1/2015	4.29	1/17/2029	6/1/2015	122.19555	115.804424	109.7997808	104.1560696	98.84955958	93.85820342	89.16150921	84.74042289	80.57722006
150601A00405	6/1/2015	4.63	1/17/2034	6/1/2015	139.41948	127.3552638	116.5113568	106.7554706	97.9703938	90.05219649	82.90865944	76.45789696	70.62714779
150601A00470	6/1/2015	2.98	5/31/2024	6/1/2015	102.94599	101.5330821	100.1464371	98.78539015	97.44929425	96.13752381	94.84947376	93.58455863	92.34221184
150601A00485	6/1/2015	3.09	6/21/2024	6/1/2015	103.25542	101.7848697	100.3426769	98.92809585	97.54040362	96.17890193	94.84291624	93.53179473	92.24490732
150601A00490	6/1/2015	3.19	7/2/2024	6/1/2015	103.18566	101.6914734	100.2265241	98.79002882	97.38123098	95.99940018	94.64383124	93.31384309	92.00877777
150601A00495	6/1/2015	2.99	6/27/2024	6/1/2015	103.15147	101.6659463	100.2093648	98.78095558	97.37997387	96.00570064	94.65744154	93.3345258	92.03630524
150601A00512	6/1/2015	3.79	7/16/2029	6/1/2015	120.28338	113.4580639	107.0765442	101.1074733	95.52188054	90.29297819	85.39598621	80.80797176	76.50770242
150601A00515	6/1/2015	2.95	1/16/2024	6/1/2015	102.0178	100.9723704	99.94835327	98.94509275	97.96196209	96.9983595	96.05370703	95.12744932	94.21905255
150601A00522	6/1/2015	4.52	7/25/2030	6/1/2015	128.13221	120.0196241	112.5014245	105.5304847	99.06366078	93.06143508	87.48759379	82.30893426	77.49499973
150601A00523	6/1/2015	4.55	7/25/2031	6/1/2015	131.67299	122.4220497	113.9248242	106.1151342	98.93296242	92.32384791	86.23834437	80.6315338	75.46258958
150601A00530	6/1/2015	3.08	7/24/2024	6/1/2015	103.50181	101.9396035	100.4086851	98.90818746	97.43727112	95.99512721	94.58097602	93.1940657	91.83367102
150601A00531	6/1/2015	3.28	7/24/2024	6/1/2015	103.49801	101.9411231	100.4153423	98.91980096	97.45366642	96.01613626	94.6064369	93.22382232	91.86757282
150601A00650	6/1/2015	2.75	3/31/2023	6/1/2015	100.46885	100.2171667	99.96674197	99.71756435	99.46962462	99.22291361	98.97742225	98.73314155	98.49006261
150601A00664	6/1/2015	3.78	1/16/2032	6/1/2015	126.44686	116.9500903	108.2706298	100.3330853	93.06940911	86.41814686	80.32376711	74.73606184	69.6096107
150601A00665	6/1/2015	3.82	1/14/2033	6/1/2015	129.02255	118.4534555	108.8790948	100.199383	92.3248302	85.17536895	78.67931704	72.77245901	67.3972326
150601A00666	6/1/2015	3.88	1/16/2035	6/1/2015	132.95041	120.29955	109.0402398	99.00940541	90.06397407	82.07832212	74.94206258	68.55812326	62.84107606
150601A00667	6/1/2015	3.88	1/16/2036	6/1/2015	134.20709	120.5780785	108.5540404	97.93384794	88.54269505	80.2285257	72.85896277	66.3186651	60.50705159
150601A00668	6/1/2015	3.89	1/16/2037	6/1/2015	135.41678	120.8313367	108.0745202	96.90252859	87.10545106	78.50239193	70.93731788	64.2755183	58.40058552
150601A00688	6/1/2015	2.61	2/21/2025	6/1/2015	104.2513	102.1105929	100.0244306	97.99103828	96.00871789	94.07583961	92.19083863	90.35221191	88.55851521
150601A00689	6/1/2015	2.81	2/28/2025	6/1/2015	104.27451	102.1227692	100.0260437	97.98254329	95.99054655	94.04840181	92.15452362	90.30738957	88.50553718
150601A00696	6/1/2015	2.83	3/13/2025	6/1/2015	104.41184	102.223255	100.09134	98.01421933	95.99009531	94.0172443	92.09401304	90.21881513	88.39012768
150601A00733	6/1/2015	2.72	5/1/2025	6/1/2015	105.00047	102.6643055	100.3918806	98.18111094	96.02999446	93.9366054	91.8990911	89.9156687	87.98462217
150601A00734	6/1/2015	2.92	5/1/2025	6/1/2015	104.96567	102.6400508	100.3776935	98.17653811	96.03460276	93.9499808	91.92083772	89.94540797	88.02199195
150601A00737	6/1/2015	2.68	12/31/2024	6/1/2015	104.01166	102.0155735	100.0680941	98.16773682	96.31306953	94.50271382	92.73534237	91.0096767	89.32448504
150601A00830	6/1/2015	6.743	7/31/2025	6/1/2015	115.97716	113.2510613	110.6050092	108.0361568	105.5417757	103.1192524	100.7660828	98.47986677	96.25830296
150601A00916	6/1/2015	7.27	4/5/2030	6/1/2015	146.69734	138.2325475	130.3527934	123.0137692	116.1747733	109.7983961	103.8502369	98.29864496	93.11448608
150601A00930	6/1/2015	7.1	8/30/2030	6/1/2015	147.7717	138.8300291	130.5359207	122.8381157	115.6897033	109.0477263	102.8728275	97.12892878	91.78294091

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150601A01024	6/1/2015	5.33	2/27/2026	6/1/2015	114.75296	111.4650463	108.2909716	105.2261122	102.2660584	99.40660724	96.64375158	93.97366945	91.39271422
150603A00017	6/3/2015	2.84	6/3/2025	6/3/2015	105.63918	103.2053421	100.8402167	98.54147751	96.30689265	94.1343187	92.02169661	89.96704787	87.96847083
150610A00008	6/10/2015	3.58	6/10/2030	6/10/2015	123.04832	115.1690978	107.8653034	101.0916323	94.80657758	88.97209056	83.55327632	78.51811715	73.83722159
150610A00009	6/10/2015	3.03	6/10/2025	6/10/2015	106.15942	103.7005875	101.3116438	98.99020457	96.7339837	94.54078652	92.40850545	90.33511595	88.31867275
150610A00017	6/10/2015	2.9	6/15/2023	6/10/2015	100.90073	100.4400468	99.98357914	99.53126582	99.08305013	98.63887644	98.19869013	97.76243755	97.33006603
150720A00011	7/20/2015	2.69	7/20/2023	7/20/2015	101.03927	100.4818478	99.93057947	99.3853622	98.84609654	98.31268528	97.78503328	97.26304749	96.74663684
150720A00012	7/20/2015	2.99	7/21/2025	7/20/2015	106.40314	103.8301645	101.3330012	98.90896211	96.55547213	94.27006394	92.0503726	89.89413056	87.799163
150721A00027	7/21/2015	3.74	7/22/2030	7/21/2015	122.74742	114.8410547	107.5173913	100.7301023	94.43678163	88.59859245	83.17994968	78.14823166	73.473519
150727A00013	7/27/2015	3.04	7/28/2025	7/27/2015	106.04096	103.4652221	100.9655715	98.53930387	96.18382622	93.89665454	91.67540837	89.51780573	87.42165833
150817A00077	8/17/2015	2.49	8/17/2023	8/17/2015	101.01488	100.3817683	99.75659179	99.13920091	98.5294507	97.92719973	97.3323101	96.74464722	96.16407982
150817A00099	8/17/2015	3.19	8/17/2027	8/17/2015	112.863	108.1347454	103.6348687	99.35109274	95.27186719	91.38632253	87.68422598	84.15594064	80.79238739
150819A00012	8/19/2015	3.04	8/19/2025	8/19/2015	106.21329	103.5768513	101.0195969	98.53865258	96.13127143	93.79482463	91.52679549	89.32477378	87.18645041
150819A00013	8/19/2015	3.51	8/19/2030	8/19/2015	121.20532	113.2815364	105.9479668	99.15724539	92.86605307	87.03475	81.62704476	76.60969492	71.95223596
150821A00018	8/21/2015	2.6	8/21/2024	8/21/2015	103.00617	101.3732957	99.77409963	98.20760309	96.6728671	95.16898852	93.69509845	92.25036048	90.83396925
150826A00038	8/26/2015	2.94	8/26/2026	8/26/2015	109.69891	105.9821081	102.412425	98.98320338	95.68812815	92.52120642	89.47674885	86.54935232	83.73388368
150826A00039	8/26/2015	3.22	8/27/2029	8/26/2015	118.68794	111.7409021	105.2553279	99.1980081	93.53829269	88.247884	83.30064393	78.67241808	74.34087518
150827A00029	8/27/2015	2.74	8/27/2024	8/27/2015	103.28047	101.6293681	100.0125279	98.42894604	96.87765979	95.35774373	93.86830777	92.40849548	90.97748246
150904A00021	9/4/2015	2.52	9/5/2023	9/4/2015	101.0936	100.4089732	99.73361001	99.06732184	98.40992658	97.76124693	97.1211103	96.48934862	95.86579822
151002A00081	10/2/2015	2.29	10/2/2023	10/2/2015	101.00754	100.2507001	99.5051715	98.77070458	98.04705454	97.33398378	96.6312616	95.93866396	95.25597325
151106A00011	11/6/2015	3.1	1/15/2026	11/6/2015	107.57036	104.5155757	101.5643973	98.71272967	95.95666166	93.29245913	90.71655597	88.22554548	85.81617222
151109A00020	11/9/2015	2.79	11/9/2023	11/9/2015	101.39048	100.5323802	99.68879008	98.85934493	98.04369093	97.241486	96.4523993	95.67611076	94.91231066
151116A00025	11/16/2015	3.04	11/14/2025	11/16/2015	106.89711	104.0186101	101.2329993	98.53679381	95.92665567	93.39938958	90.95193622	88.58136567	86.28487121
151211A00055	12/11/2015	2.62	12/11/2024	12/11/2015	103.82768	101.8877147	99.99377913	98.14450507	96.33857062	94.57470192	92.85167104	91.16829404	89.52342904
151223A00070	12/23/2015	2.57	12/26/2023	12/23/2015	101.5673	100.5803685	99.61257509	98.66336921	97.73221922	96.81861354	95.92205975	95.04208373	94.17822878
151223A00072	12/23/2015	2.81	12/23/2025	12/23/2015	107.15772	104.1558398	101.2544849	98.44973672	95.73785199	93.11525421	90.57852508	88.12439657	85.74974342
151223A00074	12/23/2015	3.01	12/23/2027	12/23/2015	114.08423	108.9438056	104.0690791	99.44490345	95.05707531	90.89226942	86.93797971	83.18246479	79.61469727
151223A00077	12/23/2015	3.57	12/24/2035	12/23/2015	134.05919	120.3006439	108.16702	97.45453716	87.98608192	79.60758976	72.18493497	65.6012543	59.75464175
151229A00079	12/29/2015	3	12/30/2025	12/29/2015	107.1397	104.1340006	101.2292637	98.42153522	95.70704357	93.08218573	90.54351866	88.08775121	85.7117365
151229A00080	12/29/2015	3.49	12/30/2030	12/29/2015	121.90634	113.6060739	105.9500052	98.88439296	92.36024878	86.33289633	80.76157113	75.60905926	70.84137125
151229A00081	12/29/2015	3.76	12/31/2035	12/29/2015	133.34971	119.8123874	107.8664328	97.31284534	87.97861217	79.71318637	72.38546113	65.88116504	60.10061811
160113A00030	1/13/2016	2.52	1/13/2025	1/13/2016	103.85941	101.8303125	99.85116143	97.92040947	96.03656436	94.19819073	92.40390744	90.65238507	88.94234365
160119A00019	1/19/2016	2.95	1/19/2027	1/19/2016	110.14196	106.044094	102.1232559	98.370839	94.77870648	91.33915938	88.04491033	84.88905924	81.86507062
160119A00025	1/19/2016	3.05	1/19/2028	1/19/2016	113.29843	108.141667	103.2539771	98.6198748	94.22484987	90.05529805	86.09845976	82.34236323	78.77577169

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160119A00026	1/19/2016	3.14	1/19/2029	1/19/2016	115.64535	109.4431824	103.6195876	98.14940293	93.0092699	88.17749273	83.63391174	79.35978685	75.33769051
160119A00027	1/19/2016	3.25	1/18/2030	1/19/2016	118.03444	110.7900502	104.0505173	97.77785315	91.93711871	86.49616578	81.42540048	76.69756781	72.28755543
160119A00028	1/19/2016	3.34	1/21/2031	1/19/2016	120.85309	112.5364703	104.8702787	97.79988756	91.2755334	85.25186085	79.68751112	74.54475052	69.78913537
160119A00029	1/19/2016	3.39	1/20/2032	1/19/2016	123.47667	114.0992316	105.5327458	97.70218499	90.53984285	83.98458817	77.98119496	72.47974378	67.43508655
160119A00030	1/19/2016	3.44	1/18/2033	1/19/2016	125.84418	115.4177268	105.9774732	97.4238879	89.6680001	82.63022838	76.2393448	70.43155839	65.14970323
160122A00029	1/22/2016	2.48	1/22/2025	1/22/2016	103.83801	101.7852433	99.78338702	97.83084209	95.92607338	94.06760501	92.25401753	90.48394532	88.75607409
160129A00066	1/29/2016	3.04	1/29/2031	1/29/2016	120.40085	111.996497	104.2546654	97.1193579	90.53959687	84.46894597	78.86508373	73.68941901	68.90674432
160129A00067	1/29/2016	2.53	1/29/2026	1/29/2016	106.58529	103.492893	100.5067913	97.62272929	94.83664408	92.14465935	89.54307582	87.02836192	84.59714511
160129A00068	1/29/2016	1.97	1/30/2023	1/29/2016	100.15652	100.0704196	99.98446918	99.89866563	99.8130086	99.72749771	99.64213261	99.55691292	99.47183828
160211A00035	2/11/2016	2.25	2/11/2025	2/11/2016	103.04458	100.9539329	98.91596012	96.92897756	94.99136581	93.1015696	91.25809462	89.45950464	87.70441878
160212A00044	2/12/2016	1.93	2/13/2023	2/12/2016	100.17961	100.0549028	99.93052234	99.80646425	99.68272729	99.55931016	99.4362116	99.31343034	99.19096514
160307A00026	3/7/2016	2.2	3/7/2023	3/7/2016	100.2744	100.0890106	99.90430953	99.72029719	99.53696967	99.35432314	99.17235378	98.99105779	98.81043143
160307A00027	3/7/2016	2.71	3/6/2026	3/7/2016	106.75916	103.5790178	100.5106373	97.54943186	94.69103031	91.93126826	89.266177	86.69197291	84.20504749
160307A00028	3/7/2016	2.91	3/7/2028	3/7/2016	112.87568	107.5989007	102.6036405	97.87334843	93.39253542	89.14670202	85.12226943	81.30651592	77.68751803
160328A00045	3/28/2016	2.49	3/27/2026	3/28/2016	106.89971	103.6431752	100.5031742	97.47482925	94.55350175	91.73477762	89.01445447	86.38852994	83.85319063
160329A00006	3/29/2016	2.12	3/29/2023	3/29/2016	100.3139	100.0679649	99.82323558	99.57969867	99.33734554	99.09616762	98.85615642	98.61730354	98.37960064
160329A00045	3/29/2016	2.12	3/29/2024	3/29/2016	101.43839	100.2026199	98.9968327	97.81994622	96.67093142	95.54880754	94.45263937	93.38153459	92.33464138
160330A00054	3/30/2016	2.9	3/31/2031	3/30/2016	119.63469	111.0938717	103.2395559	96.01264303	89.35942741	83.23107554	77.58315957	72.37523804	67.57047852
160330A00056	3/30/2016	2.26	3/31/2025	3/30/2016	103.82664	101.5864442	99.40548843	97.28177628	95.21339216	93.19850121	91.23534509	89.32223805	87.45756323
160401A00016	4/1/2016	2.42	4/1/2025	4/1/2016	103.71813	101.4860928	99.312977	97.1968021	95.13566957	93.1277604	91.17133097	89.26470926	87.40629123
160422A00026	4/22/2016	2.62	4/22/2026	4/22/2016	106.80884	103.501949	100.3153096	97.24390444	94.28295639	91.42791298	88.67443452	86.01838292	83.45581115
160504A00004	5/4/2016	2.3	5/4/2026	5/4/2016	106.54079	103.1885572	99.95976127	96.8492265	93.85202141	90.96344574	88.1790184	85.49446606	82.90571245
160524A00027	5/24/2016	3.06	5/27/2031	5/24/2016	119.312	110.7246124	102.8360718	95.58552362	88.91771145	82.78243735	77.13407513	71.93113279	67.1358587
160606A00004	6/6/2016	2.43	6/8/2026	6/6/2016	106.49618	103.0687077	99.77039158	96.5956894	93.53932441	90.59627346	87.76175342	85.03120835	82.40029752
160606A00005	6/6/2016	2.92	6/6/2031	6/6/2016	118.19746	109.6300176	101.7629258	94.53497077	87.89058782	81.77931668	76.15530873	70.97688407	66.20613318
160610A00009	6/10/2016	1.89	6/12/2023	6/10/2016	100.42746	99.97623232	99.5290593	99.08588728	98.64666261	98.21133263	97.77984559	97.35215068	96.92819795
160613A00047	6/15/2016	2.18	6/16/2025	6/15/2016	103.58516	101.1536068	98.79159503	96.49674758	94.26677906	92.09949574	89.99279129	87.94464274	85.95310668
160615A00031	6/15/2016	2.51	6/17/2030	6/15/2016	115.11113	107.5026575	100.4570736	93.92970889	87.87966142	82.2694573	77.06474709	72.23403058	67.74840708
160616A00027	6/16/2016	2.27	6/16/2026	6/16/2016	105.9947	102.5550127	99.24580195	96.06143163	92.99653877	90.04601989	87.20501691	84.46890403	81.83327531
160616A00028	6/16/2016	1.81	6/16/2023	6/16/2016	100.398	99.93597782	99.47820844	99.02463281	98.57519339	98.12983368	97.68849822	97.25113255	96.81768317
160616A00034	6/16/2016	1.97	6/17/2024	6/16/2016	101.34891	99.90828394	98.49520929	97.10896306	95.74884905	94.41419466	93.1043499	91.8186864	90.55659659
160620A00015	6/20/2016	1.71	6/20/2023	6/20/2016	100.44649	99.97240549	99.502799	99.03760556	98.57676303	98.12021046	97.66788802	97.21973699	96.77569973
160624A00011	6/24/2016	1.83	6/26/2023	6/24/2016	100.42027	99.93107726	99.44664367	98.96689571	98.49176566	98.02118712	97.55509494	97.09342522	96.63611525

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160628A00031	6/28/2016	1.77	6/28/2023	6/28/2016	100.39385	99.89931226	99.40962874	98.92473046	98.44454761	97.96901174	97.49805569	97.03161363	96.56962094
160628A00038	6/28/2016	1.88	6/27/2025	6/28/2016	103.41873	100.9495963	98.5521224	96.22381638	93.96229069	91.76525511	89.63051207	87.55595226	85.53955055
160628A00039	6/28/2016	2.01	6/29/2026	6/28/2016	105.9121	102.4208306	99.06372784	95.83492057	92.72882745	89.74014076	86.86381139	84.09503471	81.4292374
160628A00040	6/28/2016	1.56	6/28/2023	6/28/2016	100.38727	99.89157674	99.40076354	98.91476151	98.43350016	97.95691041	97.48492449	97.01747594	96.5544996
160628A00049	6/28/2016	1.88	6/27/2025	6/28/2016	103.41873	100.9495963	98.5521224	96.22381638	93.96229069	91.76525511	89.63051207	87.55595226	85.53955055
160628A00050	6/28/2016	1.56	6/28/2023	6/28/2016	100.38727	99.89157674	99.40076354	98.91476151	98.43350016	97.95691041	97.48492449	97.01747594	96.5544996
160630A00011	6/30/2016	1.8	6/30/2023	6/30/2016	100.41216	99.91213656	99.41707636	98.92690247	98.44154295	97.96092726	97.48498622	97.01365201	96.5468581
160630A00012	6/30/2016	2.11	6/30/2025	6/30/2016	103.48308	101.0164793	98.62146008	96.29553419	94.036316	91.84151703	89.70894144	87.63648159	85.62211398
160701A00019	7/1/2016	1.73	7/3/2023	7/1/2016	100.37907	99.87103526	99.36812684	98.87026822	98.37738367	97.88939897	97.40624137	96.92783954	96.45412357
160701A00020	7/1/2016	2.13	7/1/2026	7/1/2016	105.59666	102.1247893	98.78612644	95.57485358	92.48543626	89.51261096	86.6513703	83.89694903	81.24481105
160701A00039	7/1/2016	1.92	7/1/2026	7/1/2016	105.60828	102.1169776	98.76008067	95.53169403	92.42621829	89.43832906	86.56296175	83.79529739	81.13074939
160705A00005	7/5/2016	1.49	7/5/2023	7/5/2016	100.35814	99.84353376	99.3341932	98.83003991	98.33099488	97.83698071	97.34792155	96.86374307	96.38437242
160705A00104	7/5/2016	2.1	7/6/2026	7/5/2016	105.52275	102.0386178	98.68858021	95.46675738	92.36756156	89.38567952	86.5160575	83.75388702	81.09459159
160706A00006	7/6/2016	1.47	7/6/2023	7/6/2016	100.34834	99.83105286	99.31908832	98.81236634	98.31080662	97.81433048	97.32286086	96.83632224	96.35464061
160706A00010	7/6/2016	1.99	7/7/2025	7/6/2016	103.21943	100.7372379	98.32747829	95.98761965	93.71523301	91.50798916	89.36365386	87.28008339	85.2552202
160706A00026	7/6/2016	2.19	7/6/2027	7/6/2016	108.05457	103.5473264	99.25482365	95.16570546	91.26927954	87.55547136	84.01478523	80.63826794	77.41747494
160706A00027	7/6/2016	2.29	7/6/2028	7/6/2016	110.05852	104.5351862	99.32480419	94.40801499	89.76675167	85.38414999	81.24446225	77.33297779	73.63594952
160706A00028	7/6/2016	2.39	7/6/2029	7/6/2016	111.49846	104.9804554	98.88980803	93.19625153	87.87181226	82.89062532	78.22876525	73.86409121	69.7761053
160706A00029	7/6/2016	2.49	7/8/2030	7/6/2016	113.32376	105.8000022	98.83538005	92.38533212	86.40906617	80.86922371	75.73157464	70.9647404	66.53994301
160706A00030	7/6/2016	2.59	7/7/2031	7/6/2016	115.57093	107.0331124	99.20208175	92.015385	85.41639518	79.35374043	73.78079163	68.65520229	63.93849527
160707A00032	7/7/2016	1.52	7/7/2023	7/7/2016	100.3751	99.85502324	99.3403253	98.83092615	98.32674418	97.82769945	97.33371365	96.84471003	96.36061344
160712A00023	7/12/2016	1.79	7/12/2023	7/12/2016	100.41796	99.88548118	99.35864517	98.83735953	98.3215368	97.81109135	97.30593932	96.80599861	96.31118879
160714A00020	9/6/2016	2.28	9/4/2026	9/6/2016	106.54752	102.8854711	99.36927479	95.99230048	92.74825951	89.63118544	86.63541549	83.75557307	80.9865515
160714A00023	8/10/2016	2.49	8/10/2028	8/10/2016	111.27891	105.6291035	100.3035038	95.28178378	90.54500025	86.07548902	81.85677158	77.87346941	74.11122487
160714A00029	8/10/2016	2.27	8/10/2026	8/10/2016	106.35149	102.7586464	99.30682117	95.98970225	92.80129579	89.73590975	86.78813684	83.95283852	81.22512998
160714A00054	7/14/2016	2.03	7/15/2024	7/14/2016	101.5623	100.0455746	98.55892877	97.10153666	95.67260372	94.27136376	92.89707767	91.54903224	90.22653901
160718A00010	7/18/2016	1.65	7/18/2023	7/18/2016	100.45493	99.90479886	99.36069149	98.82250579	98.29014531	97.76351572	97.24252469	96.72708191	96.21709895
160726A00005	7/26/2016	2.28	7/27/2026	7/26/2016	106.29698	102.7421683	99.32574342	96.04155842	92.88377884	89.84686114	86.92553648	84.11479533	81.40987327
160727A00002	7/27/2016	1.87	7/27/2023	7/27/2016	100.47785	99.90468986	99.33805225	98.77782327	98.22389473	97.67616085	97.13451822	96.5988657	96.06910438
160801A00001	8/1/2016	1.97	8/1/2024	8/1/2016	101.54815	99.98565341	98.45466194	96.95428646	95.4836737	94.04200185	92.62847906	91.2423421	89.88285504
160802A00003	8/2/2016	2.53	8/1/2031	8/2/2016	117.15055	108.3895344	100.361043	92.99974536	86.2464602	80.04754858	74.35436863	69.12278628	64.3127362
160804A00014	8/4/2016	1.99	8/5/2024	8/4/2016	101.59818	100.0248091	98.48328877	96.9727216	95.49223984	94.04100799	92.61822128	91.22310416	89.85490907
160811A00011	8/11/2016	2.25	8/11/2026	8/11/2016	106.28558	102.6912923	99.23818197	95.91991954	92.73050094	89.66422467	86.71567465	83.8797042	81.15142089

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160815A00005	8/15/2016	2.23	8/17/2026	8/15/2016	106.2509	102.6414876	99.17435583	95.84310414	92.6416603	89.56425948	86.60542663	83.7599601	81.02291631
160815A00006	8/15/2016	2.23	8/17/2026	8/15/2016	106.2509	102.6414876	99.17435583	95.84310414	92.6416603	89.56425948	86.60542663	83.7599601	81.02291631
160815A00007	8/15/2016	2.23	8/17/2026	8/15/2016	106.2509	102.6414876	99.17435583	95.84310414	92.6416603	89.56425948	86.60542663	83.7599601	81.02291631
160816A00003	8/16/2016	1.63	8/16/2023	8/16/2016	100.46632	99.83787817	99.21728152	98.60438813	97.99905506	97.40114291	96.81051566	96.22704064	95.65058835
160830A00034	8/30/2016	1.9	8/30/2023	8/30/2016	100.53107	99.86632924	99.21034422	98.56294463	97.92396295	97.29323597	96.67060467	96.05591409	95.44901321
160830A00035	8/30/2016	2.06	8/30/2024	8/30/2016	101.81211	100.1718418	98.56565116	96.99254412	95.4515611	93.94177967	92.46231272	91.01230673	89.59094019
160830A00037	8/30/2016	2.16	8/29/2025	8/30/2016	103.94276	101.310463	98.75804784	96.28258501	93.881278	91.55145185	89.29054686	87.09611276	84.96580319
160830A00038	8/30/2016	2.24	8/28/2026	8/30/2016	106.35647	102.7162757	99.22048396	95.86256079	92.63630491	89.53583123	86.55555272	83.69016336	80.93462227
160830A00061	8/30/2018	1.89	8/30/2023	8/30/2018	100.52435	99.85962893	99.2036689	98.55629407	97.91733692	97.28663425	96.66402703	96.04936032	95.44248309
160921A00020	9/21/2016	1.97	9/21/2023	9/21/2016	100.60607	99.88217287	99.16866965	98.46533605	97.77195573	97.08831845	96.41421988	95.74946135	95.09384968
160922A00014	9/22/2016	2.06	9/22/2026	9/22/2016	106.6414	102.9091203	99.32761859	95.88994526	92.5895113	89.42007078	86.37570058	83.45078152	80.63998072
160926A00004	9/26/2016	1.66	9/26/2023	9/26/2016	100.51983	99.78111071	99.05320837	98.33589086	97.62892861	96.93209865	96.24518436	95.56797528	94.90026683
160930A00005	9/30/2016	2.03	9/30/2024	9/30/2016	101.92514	100.2026732	98.51730446	96.86789614	95.25336164	93.67265852	92.12478623	90.60878398	89.12372872
161003A00004	10/3/2016	1.91	10/3/2023	10/3/2016	100.57659	99.82077422	99.07627579	98.34284577	97.62023881	96.90821675	96.2065484	95.51500923	94.83338118
161020A00002	10/20/2016	1.96	8/15/2023	10/20/2016	100.55612	99.9315315	99.31468713	98.70544649	98.10366949	97.50921947	96.9219631	96.34177026	95.76851396
161109A00018	11/9/2016	2.63	11/9/2026	11/9/2016	108.32512	104.4533845	100.7421296	97.18388274	93.77156005	90.49844146	87.35815032	84.34463398	81.45214575
161208A00007	12/8/2016	2.6	12/8/2023	12/8/2016	101.33231	100.3972513	99.47941634	98.57833651	97.69355594	96.8246352	95.97115051	95.13269309	94.30886848
161212A00040	12/12/2016	2.45	12/12/2023	12/12/2016	101.39227	100.4436102	99.5126639	98.59894279	97.70197191	96.8212936	95.95646677	95.10706611	94.27268142
161214A00023	12/14/2016	3.3	12/15/2031	12/14/2016	124.6075	115.1727564	106.5492644	98.6624348	91.44491144	84.83583722	78.78019646	73.22822653	68.13489164
161222A00030	12/22/2016	3.09	12/22/2026	12/22/2016	111.34286	107.2724401	103.375451	99.64357661	96.06894685	92.64410885	89.36200244	86.21593731	83.19957165
170110A00020	1/10/2017	2.4	1/10/2024	1/10/2017	101.45642	100.4301274	99.42454817	98.43906239	97.47307216	96.52600304	95.59730301	94.68644134	93.79290755
170110A00022	1/10/2017	2.27	1/10/2023	1/10/2017	100.0647	100.0341339	100.0035996	99.97310046	99.94263659	99.91220786	99.88181421	99.85145558	99.82113189
170111A00009	1/11/2017	3.16	1/11/2028	1/11/2017	113.80004	108.6521841	103.7718204	99.14361811	94.75320159	90.58708951	86.63263446	82.87796701	79.31194384
170111A00011	1/11/2017	3.24	1/11/2029	1/11/2017	116.2129	110.0150232	104.1940524	98.72501613	93.58472806	88.75164721	84.20575295	79.92843014	75.9023634
170111A00012	1/11/2017	3.31	1/11/2030	1/11/2017	118.41662	111.1773978	104.4412788	98.17049875	92.33031674	86.88876059	81.8163926	77.08609628	72.67288206
170111A00013	1/11/2017	3.4	1/10/2031	1/11/2017	121.26269	112.9586953	105.3017666	98.23773072	91.71722804	85.69525768	80.13077174	74.98630912	70.22766491
170111A00014	1/11/2017	3.47	1/12/2032	1/11/2017	124.14244	114.7566426	106.1801739	98.33833029	91.16368767	84.59535518	78.57831107	73.06280894	68.00384685
170111A00016	1/11/2017	3.51	1/11/2033	1/11/2017	126.50111	116.0608936	106.6057629	98.03649335	90.2643728	83.21003435	76.80242718	70.97790562	65.67942214
170117A00046	1/17/2017	2.55	1/17/2024	1/17/2017	101.44511	100.4031293	99.38251534	98.38261621	97.40280577	96.44248289	95.50107019	94.57801293	93.6727779
170119A00006	1/19/2017	2.85	1/21/2025	1/19/2017	104.16212	102.1169046	100.1222059	98.176444	96.27810134	94.42571841	92.61789133	90.8532692	89.13055175
170120A00008	1/20/2017	3.63	1/20/2034	1/20/2017	129.37341	117.8306886	107.4705697	98.16392049	89.79639228	82.2666575	75.48486471	69.37128375	63.8551171
170120A00009	1/20/2017	3.67	1/22/2035	1/20/2017	131.16923	118.6054173	107.42822	97.47476623	88.6021975	80.68511086	73.61334201	67.2900401	61.62999446
170120A00010	1/20/2017	3.71	1/22/2036	1/20/2017	132.78756	119.2316366	107.2765553	96.72130487	87.39122623	79.13442815	71.8187094	65.32891055	59.564634

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170120A00011	1/20/2017	3.75	1/20/2037	1/20/2017	134.30291	119.7812429	107.0838881	95.9672783	86.22174386	77.6666294	70.14613715	63.52578462	57.68938291
170123A00039	1/23/2017	2.79	1/23/2026	1/23/2017	107.34287	104.2547478	101.2722688	98.39121983	95.60758045	92.91751399	90.31735807	87.80361553	85.37294592
170130A00008	1/30/2017	2.58	1/30/2023	1/30/2017	100.20237	100.1162983	100.030376	99.94459986	99.85896943	99.77348437	99.68814432	99.60294893	99.51789785
170130A00010	1/30/2017	2.92	1/30/2025	1/30/2017	104.37312	102.301895	100.2821979	98.31240003	96.39093938	94.51631449	92.68708182	90.90185297	89.15929211
170130A00031	1/30/2017	2.96	7/30/2025	1/30/2017	105.85029	103.2715743	100.7691653	98.34034523	95.98250916	93.69316191	91.46991251	89.3104691	87.21263414
170203A00012	2/3/2017	3.63	2/2/2035	2/3/2017	130.73854	118.1718843	106.9958789	97.04679231	88.18105653	80.27268436	73.21103202	66.89885659	61.25062814
170203A00013	2/3/2017	3.67	2/1/2036	2/3/2017	132.31298	118.7621432	106.8153263	96.2707085	86.95297698	78.70971532	71.4083023	64.93324486	59.18388244
170215A00040	2/15/2017	2.59	5/15/2023	2/15/2017	100.63175	100.2563583	99.88377737	99.51397161	99.14691005	98.78256213	98.42089775	98.06188725	97.70550142
170215A00041	2/15/2017	2.6	10/16/2023	2/15/2017	101.14968	100.3566604	99.57606372	98.8075966	98.05097771	97.30593441	96.57220236	95.84952523	95.13765439
170215A00043	2/15/2017	2.7	8/28/2024	2/15/2017	102.87147	101.2272925	99.61718212	98.04014289	96.49521832	94.98148887	93.49807009	92.0441109	90.61879206
170216A00043	2/16/2017	3.17	2/16/2027	2/16/2017	111.28785	107.0887885	103.0736559	99.2333779	95.55938303	92.04356884	88.67827328	85.45624816	82.37063434
170216A00044	2/16/2017	3.52	2/17/2032	2/16/2017	124.81077	115.3011396	106.6184916	98.68584476	91.43378072	84.79966551	78.7269535	73.1645661	68.06633682
170216A00045	2/16/2017	3.73	2/17/2037	2/16/2017	134.11412	119.5369293	106.8001504	95.65689629	85.89479691	77.33100602	69.80795231	63.18972112	57.35897062
170224A00020	2/24/2017	3.08	2/24/2027	2/24/2017	110.98838	106.7726776	102.7425376	98.8887684	95.20268364	91.67607449	88.30118061	85.07066292	81.97757822
170224A00021	2/24/2017	3.4	2/24/2032	2/24/2017	123.77324	114.2906927	105.6354068	97.73018451	90.50542706	83.89835272	77.85229607	72.31608249	67.24346966
170224A00039	5/24/2017	3.17	5/24/2027	5/24/2017	112.12672	107.6438757	103.3683492	99.28947801	95.39719831	91.68201242	88.13495395	84.74755545	81.51181806
170224A00044	5/24/2017	3.29	5/24/2029	5/24/2017	117.14289	110.5579649	104.3943877	98.62292402	93.21651317	88.15009534	83.40045411	78.9460721	74.76699852
170228A00014	2/28/2017	2.89	3/1/2027	2/28/2017	111.15666	106.8973422	102.8266664	98.93522896	95.21415181	91.65504797	88.24999137	84.99148869	81.87245313
170228A00015	2/28/2017	2.87	5/28/2025	2/28/2017	105.15149	102.7503349	100.4163771	98.14736325	95.9411295	93.79559672	91.70876689	89.67871937	87.70360745
170313A00032	3/13/2017	3.69	6/14/2032	3/13/2017	127.08226	117.1617671	108.1288017	99.89839508	92.39415453	85.54735324	79.29612458	73.5847448	68.362994
170313A00033	3/13/2017	3.31	3/15/2027	3/13/2017	112.11977	107.8277901	103.7264804	99.8063004	96.05823945	92.47378815	89.04490733	85.76399917	82.62388017
170313A00034	3/13/2017	3.31	3/15/2027	3/13/2017	112.11977	107.8277901	103.7264804	99.8063004	96.05823945	92.47378815	89.04490733	85.76399917	82.62388017
170313A00035	3/13/2017	3.31	3/15/2027	3/13/2017	112.11977	107.8277901	103.7264804	99.8063004	96.05823945	92.47378815	89.04490733	85.76399917	82.62388017
170316A00018	3/16/2017	2.8	3/18/2024	3/16/2017	102.00101	100.7942247	99.61596028	98.46521421	97.34103035	96.24249639	95.16874139	94.11893349	93.09227769
170317A00059	3/17/2017	2.47	3/17/2023	3/17/2017	100.40164	100.1880972	99.97547872	99.76377664	99.55298496	99.34309773	99.13410907	98.92601312	98.7188041
170322A00011	3/22/2017	2.48	3/22/2024	3/22/2017	101.85762	100.637633	99.44679882	98.28407724	97.14848148	96.03907052	94.9549464	93.89525181	92.85916784
170322A00022	3/22/2017	3.89	9/23/2041	3/22/2017	139.12447	120.4970145	104.8354647	91.6374296	80.48886508	71.04808646	63.03274479	56.20920689	50.38388511
170322A00023	3/22/2017	3.82	9/22/2039	3/22/2017	137.12955	120.1939549	105.7182265	93.32271444	82.68866754	73.54816428	65.67575002	58.88148818	53.0051802
170322A00024	3/22/2017	3.72	9/22/2036	3/22/2017	133.59357	119.4011145	106.9568383	96.03188799	86.42866022	77.97637866	70.52732033	63.95358991	58.14436013
170322A00025	3/22/2017	3.58	3/22/2033	3/22/2017	127.54363	116.8684027	107.2160782	98.48201432	90.57282953	83.40513333	76.90440841	71.00402312	65.64435864
170322A00026	3/22/2017	3.22	3/22/2028	3/22/2017	114.57724	109.2157596	104.14165	99.33792102	94.78867761	90.47904688	86.39510649	82.52381855	78.85296839
170327A00070	3/29/2017	3.05	3/29/2027	3/29/2017	112.08184	107.7251247	103.5641903	99.58912608	95.79058419	92.15974305	88.68827417	85.36831144	82.19242256
170327A00072	3/29/2017	3.09	3/29/2027	3/29/2017	112.25229	107.8919685	103.7275478	99.74911055	95.9473043	92.31330306	88.83877415	85.51584748	82.33708694

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170328A00015	3/28/2017	2.75	11/29/2024	3/28/2017	103.58783	101.6902394	99.8368292	98.02631018	96.25743679	94.52900778	92.83986437	91.18888838	89.57500063
170417A00057	4/17/2017	2.32	4/17/2023	4/17/2017	100.42907	100.1308073	99.83432343	99.53960411	99.24663353	98.95539609	98.66587637	98.37805913	98.09192933
170417A00068	4/17/2019	2.59	4/17/2024	4/17/2019	101.91743	100.6333945	99.37535762	98.14253462	96.93417538	95.74955975	94.58799603	93.44881959	92.33139147
170427A00044	4/27/2017	3.02	4/27/2027	4/27/2017	111.24942	106.8595339	102.6697255	98.66984064	94.8502945	91.20203439	87.71650766	84.38563145	81.20176455
170427A00046	4/27/2017	3.1	4/27/2028	4/27/2017	114.15376	108.7068263	103.5569385	98.68634734	94.07844998	89.71771275	85.58959708	81.68049085	77.97764491
170427A00047	4/27/2017	3.18	4/27/2029	4/27/2017	116.32468	109.8376095	103.761612	98.06844225	92.73193544	87.72784352	83.0336855	78.62861031	74.49327087
170502A00028	5/2/2017	2.84	5/3/2027	5/2/2017	111.47123	107.0325056	102.7974606	98.75570251	94.89742525	91.21336926	87.69478825	84.3334182	81.12144833
170508A00010	5/8/2017	2.43	5/8/2024	5/8/2017	102.08779	100.7435992	99.42341637	98.12665132	96.85273493	95.60111612	94.37126109	93.16265271	91.97478984
170515A00010	5/15/2017	2.58	5/15/2024	5/15/2017	102.06244	100.7037887	99.36964537	98.05940294	96.77247467	95.50829261	94.26630684	93.04598472	91.84681024
170518A00034	5/18/2017	2.15	5/18/2023	5/18/2017	100.5473	100.163087	99.78181643	99.40345674	99.02797452	98.6553369	98.28551151	97.91846649	97.55417043
170524A00011	5/24/2017	2.54	5/24/2024	5/24/2017	102.07117	100.6879205	99.33002047	97.99683521	96.68774875	95.4021651	94.13950748	92.89921756	91.68075472
170530A00064	5/30/2017	2.32	3/27/2023	5/30/2017	100.35723	100.1167202	99.87736292	99.63914962	99.40207214	99.16612241	98.93129241	98.69757422	98.46495998
170531A00080	5/31/2017	2.3	5/31/2024	5/31/2017	102.03601	100.6298596	99.2498652	97.89535604	96.56568818	95.26023894	93.97840605	92.71960681	91.48327724
170602A00023	6/2/2017	2.09	6/2/2023	6/2/2017	100.57361	100.1482889	99.72655866	99.30837708	98.89369941	98.48248172	98.07468079	97.67025413	97.26915995
170602A00026	6/2/2017	2.25	6/3/2024	6/2/2017	101.98014	100.5665516	99.17939439	97.81799328	96.48169405	95.16986424	93.8818922	92.61718624	91.37517381
170608A00020	6/8/2017	2.27	6/10/2024	6/8/2017	102.04562	100.6132046	99.20790464	97.82902157	96.4758763	95.14781255	93.8441959	92.56441292	91.30787023
170609A00026	6/9/2017	2.3	6/9/2023	6/9/2017	100.60898	100.1653777	99.72568841	99.28986068	98.85784374	98.42958766	98.00504339	97.58416274	97.16689833
170609A00043	6/9/2017	3.07	6/9/2032	6/9/2017	123.52839	113.6707997	104.7029092	96.539111	89.10246114	82.32376512	76.14076131	70.49739385	65.3431652
170612A00039	6/12/2017	2.29	6/12/2024	6/12/2017	102.08536	100.647398	99.2367583	97.85272814	96.49462114	95.16177409	93.85354593	92.56931685	91.30848745
170613A00032	6/13/2017	2.45	6/13/2025	6/13/2017	104.754	102.3047662	99.92548079	97.61374928	95.36727522	93.18385423	91.06136975	88.9977889	86.99115872
170613A00033	6/13/2017	2.3	6/13/2024	6/13/2017	102.10531	100.664576	99.25126558	97.86466128	96.50407303	95.16883411	93.85830014	92.57184815	91.30887565
170615A00015	6/15/2017	2.25	6/14/2024	6/15/2017	102.03727	100.5944441	99.17912402	97.79059537	96.42816478	95.09116233	93.77894058	92.49087364	91.22635624
170622A00036	6/22/2017	3.23	6/22/2032	6/22/2017	122.84206	113.0942823	104.2252089	96.15029153	88.79354942	82.08665667	75.96813506	70.38263561	65.28029874
170622A00037	6/22/2017	3.27	6/22/2033	6/22/2017	124.77769	114.0064425	104.2938788	95.52920955	87.61381045	80.4598272	73.98894877	68.13132586	62.82461684
170622A00038	6/22/2017	3.32	6/22/2034	6/22/2017	126.50557	114.7309728	104.207933	94.79506422	86.36769329	78.81580349	72.04224251	65.96115748	60.49662746
170622A00039	6/22/2017	3.36	6/22/2035	6/22/2017	127.9207	115.1738413	103.8823781	93.86993515	84.98245292	77.08525634	70.06052391	63.8050987	58.22859336
170622A00040	6/22/2017	3.41	6/23/2036	6/22/2017	129.33259	115.6275081	103.5933461	93.01405109	83.70268056	75.49734286	68.25772107	61.86209456	56.20478493
170623A00028	6/23/2017	2.79	6/23/2027	6/23/2017	110.66889	106.1381046	101.8209203	97.70614652	93.78323425	90.0422387	86.47378177	83.06901675	79.81959546
170629A00073	6/29/2017	2.2	6/29/2023	6/29/2017	100.70995	100.2105892	99.71617242	99.22662401	98.74187233	98.26184717	97.78647968	97.31570232	96.84944888
170630A00027	6/30/2017	2.35	6/28/2024	6/30/2017	102.26056	100.779357	99.3270805	97.90295488	96.50623478	95.13620068	93.79215778	92.47343491	91.17938353
170706A00090	7/6/2017	2.48	7/6/2023	7/6/2017	100.77189	100.2545633	99.74253972	99.23573994	98.7340843	98.23749473	97.74589472	97.25920932	96.77736505
170728A00031	7/28/2017	2.27	1/27/2023	7/28/2017	100.15868	100.0809531	100.0033554	99.92588321	99.84853623	99.77131416	99.69421669	99.61724355	99.54039443
170728A00032	7/28/2017	2.36	7/27/2023	7/28/2017	100.76145	100.1873605	99.61979634	99.05864831	98.50380812	97.9551699	97.41263014	96.8760876	96.34544329

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
170728A00033	7/28/2017	2.46	1/29/2024	7/28/2017	101.39334	100.3198959	99.2691159	98.24029176	97.2327409	96.24580873	95.27886728	94.33131382	93.40256967
170728A00040	7/28/2017	2.44	1/27/2025	7/28/2017	103.78811	101.7226193	99.70856189	97.74431915	95.8283321	93.95910231	92.13518904	90.35520653	88.61782148
170731A00029	7/31/2017	2.34	7/31/2023	7/31/2017	100.75919	100.1743099	99.59620307	99.0247501	98.45983665	97.90135104	97.34918412	96.80322918	96.26338192
170803A00020	8/3/2017	2.84	8/3/2027	8/3/2017	111.19485	106.5406398	102.1102577	97.89173205	93.8738002	90.04585883	86.39792186	82.92058115	79.6049698
170803A00021	8/3/2017	2.5	8/5/2024	8/3/2017	102.41785	100.8376627	99.28944737	97.77230246	96.28535714	94.82777284	93.39874183	91.99748572	90.62325422
170803A00032	8/3/2017	2.12	8/3/2023	8/3/2017	100.75167	100.157275	99.56988068	98.98936436	98.41560567	97.84848706	97.2878937	96.73371342	96.18583657
170809A00005	8/9/2017	2.61	8/11/2025	8/9/2017	105.02439	102.4248648	99.90304594	97.4561369	95.08145751	92.77644189	90.53863276	88.36567597	86.25531546
170815A00006	8/15/2017	2.5	8/15/2024	8/15/2017	102.47707	100.8701159	99.29602062	97.75384085	96.24266935	94.76163312	93.3098918	91.88663612	90.49108644
170818A00003	8/18/2017	2.23	8/20/2024	8/18/2017	102.38855	100.7635972	99.17213395	97.61319282	96.08584095	94.58918115	93.12235014	91.68451693	90.27488129
170821A00038	8/23/2017	2.39	8/23/2024	8/23/2017	102.67122	101.0359337	99.43445014	97.8657881	96.32900239	94.82318414	93.34745903	91.90098555	90.48295351
170822A00018	8/22/2017	2.25	8/22/2023	8/22/2017	100.7519	100.1078064	99.47193077	98.84412022	98.22422196	97.61208703	97.00757021	96.41052986	95.82082784
170822A00019	8/22/2017	2.44	8/22/2024	8/22/2017	102.40291	100.7784997	99.18754585	97.62907975	96.10216915	94.6059174	93.13946175	91.70197172	90.29264759
170822A00020	8/22/2017	2.59	8/22/2025	8/22/2017	105.04432	102.4155888	99.86609823	97.39296622	94.9934355	92.66486773	90.40473748	88.21062651	86.08021838
170824A00038	8/24/2017	2.23	8/24/2023	8/24/2017	100.74242	100.0929902	99.45191356	98.81903292	98.19419181	97.57723775	96.96802205	96.36639979	95.77222961
170831A00004	8/31/2017	2	8/31/2023	8/31/2017	100.72575	100.0559846	99.39509706	98.74291462	98.09926623	97.46398528	96.83690946	96.21788064	95.60674473
170831A00022	8/31/2017	2.27	2/29/2024	8/31/2017	101.27566	100.121215	98.99300179	97.8901308	96.81175572	95.75706752	94.72529246	93.71569016	92.72755183
170906A00020	9/6/2017	2.14	9/6/2023	9/6/2017	100.70463	100.0204812	99.34560358	98.6798143	98.02293058	97.37477458	96.73517315	96.1039577	95.48096405
170908A00017	9/9/2019	2.32	9/9/2024	9/9/2019	102.30269	100.6320016	98.99642026	97.39490371	95.82645042	94.29009825	92.78492252	91.31003412	89.86457783
170914A00039	9/14/2017	2.23	9/16/2024	9/14/2017	102.54494	100.8474961	99.18610626	97.55968682	95.9671978	94.40764072	92.88005652	91.38352355	89.91715572
170915A00001	9/15/2017	2.43	9/16/2024	9/15/2017	102.53058	100.8395583	99.18435667	97.56389793	95.97715107	94.42312618	92.9008723	91.40947548	89.94805695
170915A00031	9/15/2017	2.1	9/15/2023	9/15/2017	100.82528	100.1148138	99.41434744	98.72366912	98.04257455	97.3708651	96.70834756	96.05483406	95.41014176
170918A00007	9/18/2017	2.8	9/20/2027	9/18/2017	111.33552	106.5505476	102.0010787	97.67422891	93.55788774	89.64067226	85.91187873	82.3614382	78.97987503
170919A00073	9/19/2017	2.28	9/19/2024	9/19/2017	102.64909	100.9428175	99.27291182	97.63827256	96.03784689	94.47062418	92.93563388	91.43194347	89.95865655
170929A00057	9/29/2017	2.16	9/29/2023	9/29/2017	100.90047	100.1521242	99.41484963	98.68839949	97.97253675	97.2670313	96.57165969	95.8862048	95.21045572
171005A00006	10/5/2017	2.32	10/7/2024	10/5/2017	102.83047	101.0744809	99.35675832	97.67615121	96.03155749	94.4219184	92.8462163	91.30347261	89.79274596
171011A00013	10/11/2017	2.77	10/13/2026	10/11/2017	108.65433	104.8491782	101.1989065	97.69636311	94.33476724	91.10768841	88.00902611	85.03299095	82.17408681
171018A00003	10/18/2017	2.23	10/18/2023	10/18/2017	101.00845	100.2086966	99.42158117	98.6468088	97.88409065	97.13314687	96.39370621	95.6655057	94.94829035
171018A00011	10/18/2017	2.68	10/18/2027	10/18/2017	112.0037	107.0941711	102.4305036	97.99908324	93.78712587	89.78261791	85.97426583	82.35144917	78.90417684
171025A00026	10/25/2017	2.64	10/25/2024	10/25/2017	103.16799	101.3662786	99.60468548	97.88206671	96.19731991	94.54938148	92.93722497	91.35985957	89.81632851
171026A00007	10/26/2017	2.47	10/26/2023	10/26/2017	101.0679	100.2486497	99.44265427	98.64959201	97.86915347	97.101039	96.34495841	95.60063053	94.86778292
171026A00008	10/26/2017	2.6	10/25/2024	10/26/2017	103.09485	101.2938255	99.53290628	97.81094903	96.12685169	94.47955099	92.86802081	91.29127062	89.74834396
171026A00009	10/26/2017	2.75	10/27/2025	10/26/2017	105.9366	103.1195841	100.3921804	97.75106369	95.19304872	92.71508568	90.3142535	87.98775367	85.73290443
171026A00010	10/26/2017	2.84	10/26/2026	10/26/2017	109.02532	105.1775284	101.4876373	97.94834605	94.55273307	91.2942311	88.16660694	85.16394273	82.28061838

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
171026A00011	10/26/2017	2.94	10/26/2027	10/26/2017	112.19886	107.2972211	102.6410621	98.21681205	94.01172324	90.0138125	86.21181166	82.59512129	79.15376769
171030A00023	10/30/2017	2.9	11/1/2027	10/30/2017	112.04656	107.1322953	102.4649604	98.03088263	93.81721284	89.81187285	86.00350543	82.38142777	78.93558815
171127A00016	11/27/2017	2.28	11/27/2023	11/27/2017	101.17756	100.270024	99.37872706	98.50323323	97.64312511	96.79799985	95.96746856	95.15115569	94.34869849
171129A00020	11/29/2017	2.89	11/30/2026	11/29/2017	109.4951	105.5452534	101.7610715	98.13474298	94.6588682	91.32643258	88.13078467	85.06561548	82.12493902
171206A00038	12/6/2017	2.69	12/6/2027	12/6/2017	112.37408	107.3226989	102.5306512	97.98327619	93.66681264	89.56834275	85.67573606	81.97759757	78.46321943
171206A00041	12/6/2017	2.44	12/6/2024	12/6/2017	103.44112	101.5185978	99.64140574	97.80819894	96.01768433	94.26861547	92.55979057	90.89005055	89.25827723
171206A00048	12/6/2017	3.04	12/6/2032	12/6/2017	124.09285	113.7388496	104.3617567	95.8634682	88.15622969	81.16149213	74.80890343	69.0354149	63.78448911
171219A00063	12/19/2017	2.8	12/20/2027	12/19/2017	113.01363	107.9079244	103.0660741	98.47305685	94.11477876	89.97801616	86.05035741	82.32014885	78.77644471
171227A00018	12/27/2017	2.83	12/27/2024	12/27/2017	103.94277	101.9660781	100.0371596	98.15456456	96.31689592	94.52280841	92.77100622	91.06024083	89.38930895
180102A00020	1/2/2018	2.5	1/3/2023	1/2/2018	100.0249	100.0137926	100.0026956	99.99160909	99.98053314	99.96946771	99.95841278	99.94736833	99.93633434
180102A00021	1/2/2018	2.82	1/2/2026	1/2/2018	106.62108	103.615262	100.7106644	97.90332119	95.18944218	92.56540691	90.02775616	87.57318369	85.19852862
180103A00011	1/3/2018	2.35	1/3/2023	1/3/2018	100.02442	100.0132989	100.0021912	99.99109413	99.98000774	99.968932	99.95786689	99.94681239	99.93576848
180103A00019	1/3/2018	2.51	1/3/2023	1/3/2018	100.02501	100.0139036	100.0028065	99.99171989	99.98064385	99.96957832	99.95852329	99.94747875	99.93644467
180103A00027	1/3/2018	2.51	1/3/2023	1/3/2018	100.02501	100.0139036	100.0028065	99.99171989	99.98064385	99.96957832	99.95852329	99.94747875	99.93644467
180104A00013	1/4/2018	2.39	1/4/2023	1/4/2018	100.03108	100.0171789	100.0032944	99.98942362	99.97556656	99.9617232	99.9478935	99.93407744	99.920275
180104A00017	1/4/2018	2.77	1/3/2025	1/4/2018	103.87161	101.8769755	99.93090516	98.03190764	96.17855123	94.36945786	92.60330061	90.87880146	89.19472913
180104A00018	1/4/2018	2.97	1/4/2027	1/4/2018	110.09982	106.0428776	102.1598357	98.44231436	94.88237859	91.47251664	88.2056149	85.07493464	82.07409018
180109A00028	1/9/2018	2.6	1/9/2025	1/9/2018	103.99525	101.9753529	100.0050141	98.08269735	96.20692851	94.37628937	92.58941499	90.84499128	89.14175274
180110A00027	1/10/2018	2.6	1/10/2023	1/10/2018	100.07242	100.0418648	100.0113465	99.98086318	99.95041483	99.92000137	99.88962272	99.85927883	99.82896963
180110A00028	1/10/2018	2.85	1/10/2025	1/10/2018	104.08331	102.0679865	100.1019971	98.18381959	96.31198876	94.48509457	92.70177991	90.96073818	89.260711
180110A00029	1/10/2018	3.13	1/10/2028	1/10/2018	113.64266	108.5013823	103.6272024	99.00480988	94.61985492	90.45887999	86.50925969	82.759145	79.19741149
180111A00007	1/11/2018	2.66	1/14/2025	1/11/2018	104.15382	102.118976	100.1342482	98.1980799	96.30897258	94.46548473	92.66622939	90.90987167	89.19512633
180111A00016	1/11/2018	2.57	1/11/2023	1/11/2018	100.078	100.0446724	100.0113822	99.97813105	99.94491896	99.91174583	99.8786116	99.84551619	99.81245952
180116A00010	1/16/2018	2.58	1/17/2023	1/16/2018	100.1175	100.0675144	100.017593	99.96773846	99.91795076	99.86822972	99.8185752	99.76898707	99.71946518
180116A00014	1/16/2018	3.01	1/19/2027	1/16/2018	110.38518	106.282416	102.356827	98.59980748	95.00321499	91.55934492	88.26090458	85.10098882	82.07305728
180116A00015	1/16/2018	3.06	1/18/2028	1/16/2018	113.34247	108.1872838	103.3009503	98.66800939	94.27396852	90.10523952	86.14907756	82.39352431	78.82735534
180116A00031	1/16/2018	2.58	1/17/2023	1/16/2018	100.1175	100.0675144	100.017593	99.96773846	99.91795076	99.86822972	99.8185752	99.76898707	99.71946518
180116A00046	1/16/2018	2.58	1/11/2023	1/16/2018	100.07834	100.0450054	100.0117149	99.97846346	99.94525108	99.91207767	99.87894315	99.84584746	99.81279051
180118A00004	1/18/2018	2.88	1/17/2025	1/18/2018	104.19519	102.1601959	100.1752978	98.23893823	96.34961815	94.50589586	92.70638427	90.94974835	89.23470284
180118A00037	1/18/2018	2.88	1/21/2025	1/18/2018	104.22418	102.1783068	100.182966	98.23657473	96.33761484	94.48462656	92.67620568	90.91100098	89.18771188
180118A00039	1/18/2018	3.09	1/19/2027	1/18/2018	110.70949	106.6001788	102.668255	98.90509878	95.30255966	91.85292563	88.54889691	85.38356158	82.35037282
180124A00020	1/24/2018	2.53	1/24/2023	1/24/2018	100.16511	100.0956327	100.0262654	99.95700512	99.88785164	99.81880468	99.749864	99.68102936	99.6123005
180125A00022	1/25/2018	2.69	1/25/2023	1/25/2018	100.17767	100.105469	100.0333811	99.96140575	99.88954279	99.81779191	99.74615286	99.67462537	99.6032092

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180126A00028	1/26/2018	2.69	1/26/2023	1/26/2018	100.1845	100.109527	100.0346701	99.95993217	99.88531296	99.81081218	99.73642957	99.66216486	99.58801775
180126A00029	1/26/2018	2.88	1/27/2025	1/26/2018	104.26765	102.2054769	100.1944795	98.23305206	96.3196476	94.45277893	92.63101597	90.85298306	89.11735647
180130A00070	1/30/2018	3.14	1/29/2027	1/30/2018	110.99895	106.8570147	102.8947325	99.10333154	95.47451849	92.00044864	88.67369896	85.48724299	82.43442741
180130A00084	1/30/2018	2.59	1/30/2023	1/30/2018	100.2099	100.1237556	100.0377594	99.95191009	99.86620741	99.78065095	99.69524034	99.60997523	99.52485525
180130A00085	1/30/2018	2.79	1/30/2025	1/30/2018	104.54225	102.4607346	100.4311434	98.45183272	96.52122469	94.63780281	92.80010921	91.00674185	89.25635197
180130A00091	1/30/2018	2.74	1/25/2023	1/30/2018	100.18128	100.1090763	100.0369853	99.96500686	99.89314081	99.82138685	99.74974472	99.67821416	99.60679492
180205A00018	2/5/2018	2.66	2/3/2023	2/5/2018	100.23654	100.1392903	100.0422322	99.94536892	99.84869988	99.75222446	99.65594207	99.55985211	99.46395397
180205A00019	2/5/2018	2.88	2/5/2025	2/5/2018	104.7821	102.6809654	100.6325276	98.63511023	96.68710105	94.78695123	92.93317231	91.12433334	89.35905818
180205A00050	2/5/2018	2.81	2/6/2023	2/5/2018	100.25646	100.15099	100.0457526	99.94074592	99.8359693	99.73142193	99.62710303	99.52301184	99.41914757
180206A00013	2/6/2018	2.72	2/6/2024	2/6/2018	101.92087	100.8200561	99.74298347	98.68888882	97.6570425	96.64674543	95.65732758	94.68814644	93.73858563
180207A00002	2/7/2018	3.13	2/6/2026	2/7/2018	107.84773	104.7289291	101.7174229	98.80890317	95.99925938	93.28457053	90.66109537	88.12526291	85.67366351
180207A00003	2/7/2018	3.28	2/7/2028	2/7/2018	114.59227	109.3515879	104.3861869	99.68011218	95.21841728	90.98709664	86.97302129	83.16387933	79.54812061
180214A00004	2/14/2018	2.71	2/14/2023	2/14/2018	100.29963	100.1718507	100.0444085	99.9173052	99.79053943	99.66410979	99.5380149	99.41225339	99.28682388
180216A00004	2/16/2018	2.75	2/16/2023	2/16/2018	100.31555	100.1822164	100.049249	99.91664873	99.78441398	99.65254319	99.52103483	99.38988735	99.25909923
180222A00025	2/22/2018	3.48	2/22/2033	2/22/2018	128.85554	118.0629192	108.3017781	99.46695114	91.46454492	84.2106755	77.63035298	71.65649555	66.22905734
180222A00026	2/22/2018	2.98	2/21/2025	2/22/2018	105.13405	102.9836067	100.8879049	98.84516476	96.85368266	94.91182351	93.01801739	91.17075635	89.36859144
180222A00027	2/22/2018	3.24	2/22/2028	2/22/2018	115.69839	110.3490555	105.283366	100.4847239	95.93759581	91.62743589	87.54061748	83.66436998	79.98672035
180223A00022	2/23/2018	2.93	2/23/2023	2/23/2018	100.35351	100.2010404	100.0490422	99.89751038	99.74644282	99.5958374	99.44569201	99.29600454	99.14677292
180313A00026	3/13/2018	3.34	3/13/2028	3/13/2018	115.14268	109.7913998	104.725544	99.92831019	95.38397732	91.0778308	86.99609215	83.12585422	79.45502123
180323A00013	3/23/2018	3.18	3/23/2028	3/23/2018	115.60064	110.1698358	105.0310453	100.166946	95.56133993	91.19907425	87.06596755	83.14874206	79.43496091
180327A00024	3/27/2018	2.79	5/26/2023	3/27/2018	100.83651	100.4296822	100.0261375	99.62583705	99.22874176	98.83481322	98.4440136	98.05630569	97.67165286
180328A00010	3/28/2018	3.1	3/28/2025	3/28/2018	105.22287	102.9842967	100.8044815	98.68145067	96.613312	94.59825276	92.63453562	90.72049482	88.8545325
180329A00003	3/29/2018	3.08	3/29/2028	3/29/2018	115.11578	109.6808187	104.5390905	99.67314809	95.06667945	90.70442802	86.57211842	82.65638765	78.94472158
180402A00005	4/2/2018	2.94	4/3/2023	4/2/2018	100.54194	100.28189	100.0231868	99.76581964	99.50977815	99.25505212	99.00163141	98.749506	98.49866597
180403A00005	4/3/2018	2.72	4/3/2023	4/3/2018	100.53651	100.2759097	100.0166665	99.75876858	99.50220535	99.24696644	98.99304155	98.74042052	98.48909327
180403A00006	4/3/2018	3.07	4/3/2028	4/3/2018	115.09402	109.6459955	104.4926052	99.61629429	95.00064984	90.63032105	86.49094452	82.56907517	78.85212238
180403A00041	4/3/2018	2.91	4/3/2025	4/3/2018	105.32078	103.0554006	100.8500235	98.70263274	96.61129605	94.57416155	92.58945387	90.65547025	88.77057686
180406A00014	4/6/2018	2.95	4/6/2023	4/6/2018	100.56292	100.2945599	100.0276398	99.76214615	99.49806734	99.23539207	98.97410913	98.71420744	98.45567601
180410A00017	4/10/2018	3.02	10/10/2023	4/10/2018	101.45131	100.6731424	99.90690416	99.15232567	98.40914202	97.6770963	96.95593931	96.24542921	95.54533129
180412A00034	4/12/2018	3.23	4/15/2030	4/12/2018	120.09761	112.4760454	105.4026214	98.83485897	92.7337835	87.06362134	81.79152113	76.88730076	72.32321747
180412A00036	4/12/2018	3.54	4/15/2038	4/12/2018	135.97234	120.0320947	106.256965	94.33530005	84.00208236	75.03172608	67.23201804	60.43901681	54.51275416
180426A00011	4/26/2018	2.94	4/26/2023	4/26/2018	100.72592	100.4016743	100.0795225	99.75944161	99.44141186	99.12541349	98.81142704	98.4994333	98.18941331
180426A00053	4/26/2018	2.94	4/26/2023	4/26/2018	100.72592	100.4016743	100.0795225	99.75944161	99.44141186	99.12541349	98.81142704	98.4994333	98.18941331

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180503A00040	5/3/2018	3.3	5/5/2025	5/3/2018	105.99149	103.6427408	101.3580829	99.13542175	96.97274165	94.86810395	92.81964367	90.82556623	88.88414439
180511A00035	5/11/2018	2.93	5/11/2023	5/11/2018	100.80816	100.4425344	100.0795719	99.71924273	99.36151816	99.00636987	98.65376997	98.30369097	97.95610577
180514A00035	5/14/2018	3.07	5/14/2024	5/14/2018	103.00742	101.6402819	100.297814	98.97940809	97.68447309	96.41243671	95.16274487	93.93486101	92.72826532
180518A00014	5/18/2018	3.17	5/18/2023	5/18/2018	100.87176	100.4875668	100.1063028	99.72793875	99.35244142	98.97977826	98.60991719	98.2428266	97.87847537
180521A00025	5/21/2018	3.24	5/21/2025	5/21/2018	106.49765	104.0885791	101.7465309	99.46927223	97.25465523	95.10061579	93.00516996	90.96641026	88.98250229
180522A00019	5/22/2018	3.16	5/22/2023	5/22/2018	100.88732	100.492182	100.100147	99.71117421	99.3252277	98.94227224	98.56227308	98.18519604	97.81100745
180529A00042	5/29/2018	3.42	5/30/2028	5/29/2018	116.06466	110.4770904	105.198273	100.2095074	95.49331638	91.03336328	86.81437183	82.82205219	79.04303242
180529A00043	5/29/2018	2.99	5/30/2023	5/29/2018	100.86676	100.4497578	100.036198	99.62603366	99.21922307	98.81572531	98.41550013	98.0185079	97.62470965
180529A00044	5/29/2018	3.11	5/29/2024	5/29/2018	102.89525	101.4926149	100.1159021	98.76445072	97.43762597	96.13481372	94.85541985	93.59886939	92.36460578
180529A00056	5/29/2018	3	5/26/2023	5/29/2018	100.84938	100.4433539	100.0405971	99.64106807	99.24472801	98.85153888	98.46146321	98.07446413	97.69050535
180529A00066	5/29/2018	2.99	5/26/2023	5/29/2018	100.8453	100.4392887	100.0365419	99.63702271	99.24069247	98.8475131	98.45744713	98.0704577	97.68650851
180530A00014	5/30/2018	2.93	5/30/2023	5/30/2018	100.84164	100.4247054	100.011208	99.60110563	99.19435661	98.79092006	98.39075571	97.99382397	97.60008584
180530A00024	5/30/2018	3.44	5/30/2029	5/30/2018	118.12903	111.4970345	105.2898632	99.47798697	94.03408036	88.93284226	84.15083633	79.66634455	75.4592331
180530A00025	5/30/2018	3.49	5/30/2030	5/30/2018	120.54097	112.8552083	105.7277921	99.11501578	92.97681044	87.27642616	81.98014118	77.05699815	72.47856443
180530A00026	5/30/2018	3.55	5/30/2031	5/30/2018	123.40071	114.6391681	106.5874469	99.18385783	92.37238144	86.10212181	80.32681387	75.00438029	70.09653272
180530A00027	5/30/2018	3.61	6/1/2032	5/30/2018	126.26512	116.4149985	107.4440287	99.26828985	91.81229934	85.008126	78.79459894	73.11660291	67.92445038
180530A00028	5/30/2018	3.67	5/31/2033	5/30/2018	128.78092	117.8644934	108.0100346	99.10729088	91.05803173	83.77467919	77.17910211	71.20155255	65.77972664
180530A00030	5/30/2018	3.68	5/30/2034	5/30/2018	130.44426	118.5113579	107.8343571	98.27246208	89.7014077	82.01143985	75.1055523	68.89794545	63.31267836
180530A00072	5/30/2018	3.06	5/30/2024	5/30/2018	102.83117	101.4263092	100.0474496	98.69393472	97.36512646	96.06040779	94.77918176	93.52087069	92.28491541
180531A00015	5/31/2018	2.95	5/31/2023	5/31/2018	100.85491	100.4352137	100.0189998	99.60622751	99.19685441	98.79083865	98.3881391	97.98871532	97.59252749
180604A00048	6/4/2018	3.01	6/5/2023	6/4/2018	100.90553	100.4720536	100.0423019	99.61622696	99.19378163	98.77491962	98.35959544	97.94776433	97.53938232
180604A00050	6/4/2018	3.15	6/4/2024	6/4/2018	102.99489	101.5757006	100.1830132	98.81615219	97.4744617	96.15730758	94.86407654	93.59417527	92.34702966
180611A00030	6/11/2018	2.91	6/12/2023	6/11/2018	100.97654	100.522833	100.0732091	99.62761693	99.18600233	98.74831201	98.31449363	97.88449582	97.45826807
180614A00038	6/14/2018	3.08	6/14/2023	6/14/2018	100.97879	100.5206276	100.0666242	99.61672797	99.17088326	98.72903538	98.29113063	97.85711627	97.42694048
180618A00026	6/18/2018	3.05	4/13/2023	6/18/2018	100.62571	100.3380437	100.0520313	99.76765955	99.48491427	99.20378144	98.92424724	98.64629796	98.36992008
180619A00020	6/19/2018	3.1	6/19/2025	6/19/2018	106.40648	103.9206971	101.5062071	99.16055932	96.88140056	94.66647251	92.5136074	90.42072376	88.3858224
180619A00021	6/19/2018	3.24	6/19/2028	6/19/2018	116.48276	110.7874174	105.4108803	100.3335895	95.53728871	91.00492817	86.72057858	82.66935207	78.83732882
180619A00023	6/19/2018	3.04	6/19/2023	6/19/2018	100.98133	100.5095903	100.0422575	99.57927451	99.12058078	98.66611678	98.21582409	97.76964538	97.32752434
180620A00014	6/20/2018	3.4	6/20/2028	6/20/2018	116.07667	110.4330293	105.1043085	100.0712381	95.31582829	90.8212749	86.57187564	82.55295223	78.75077853
180620A00038	6/20/2018	3.4	6/20/2028	6/20/2018	116.07667	110.4330293	105.1043085	100.0712381	95.31582829	90.8212749	86.57187564	82.55295223	78.75077853
180620A00044	6/20/2018	2.89	6/20/2023	6/20/2018	101.0092	100.5335359	100.0623605	99.59560894	99.13321886	98.67512921	98.22128003	97.77161249	97.32606884
180621A00017	6/21/2018	3.42	6/21/2028	6/21/2018	116.19169	110.5423066	105.2082551	100.1702399	95.41024066	90.91142545	86.65806636	82.63546161	78.82986349
180622A00004	6/22/2018	3.47	12/22/2028	6/22/2018	117.49281	111.3107198	105.5009636	100.0390891	94.90237356	90.06969332	85.52140299	81.23922487	77.20614701

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180622A00005	6/22/2018	3.5	7/2/2029	6/22/2018	118.6761	111.9403327	105.6412824	99.74821549	94.23271817	89.06850865	84.23126688	79.69847852	75.44929203
180622A00006	6/22/2018	3.53	12/21/2029	6/22/2018	119.82814	112.5962581	105.8624279	99.58955872	93.743511	88.29284506	83.20859442	78.46405937	74.03461867
180622A00018	6/22/2018	2.92	6/22/2023	6/22/2018	101.03411	100.5529134	100.0763072	99.60422433	99.13660065	98.67337302	98.21447952	97.75985941	97.30945307
180625A00041	6/25/2018	3.06	6/20/2023	6/25/2018	100.99597	100.5214566	100.0514096	99.58576201	99.12445207	98.66741928	98.21460428	97.76594877	97.32139554
180627A00026	6/27/2018	2.87	6/27/2023	6/27/2018	101.03581	100.5409574	100.0509513	99.56571911	99.08519134	98.60929973	98.13797739	97.67115871	97.20877932
180627A00027	6/27/2018	2.87	6/27/2023	6/27/2018	101.03581	100.5409574	100.0509513	99.56571911	99.08519134	98.60929973	98.13797739	97.67115871	97.20877932
180629A00008	6/29/2018	3.02	6/29/2023	6/29/2018	101.0223	100.5232136	100.0290527	99.53974024	99.05520519	98.57537791	98.1001901	97.62957477	97.16346622
180629A00071	6/29/2018	3.02	6/29/2023	6/29/2018	101.0223	100.5232136	100.0290527	99.53974024	99.05520519	98.57537791	98.1001901	97.62957477	97.16346622
180702A00012	7/2/2018	3.01	7/3/2023	7/2/2018	101.03511	100.5251249	100.0202833	99.5205055	99.02571563	98.5358393	98.05080359	97.57053702	97.09496952
180702A00034	7/2/2018	2.86	7/3/2023	7/2/2018	101.05948	100.5482039	100.0421004	99.54108852	99.04509182	98.55403516	98.06784497	97.58644911	97.10977688
180703A00015	7/3/2018	3.06	7/3/2023	7/3/2018	101.06073	100.5506753	100.0457582	99.5459054	99.0510411	98.56109087	98.0759818	97.59564239	97.12000256
180705A00003	7/5/2018	3.04	7/5/2023	7/5/2018	101.05919	100.5437103	100.0334835	99.52843143	99.02847568	98.53353931	98.04354699	97.55842485	97.07810052
180705A00062	7/5/2018	3.04	7/6/2023	7/5/2018	101.06355	100.5453385	100.0324424	99.52477664	99.02226131	98.52481833	98.0323711	97.5448446	97.06216527
180706A00013	7/6/2018	3.01	7/6/2023	7/6/2018	101.04792	100.5297613	100.0169119	99.50929253	99.00682326	98.50942599	98.01702415	97.52954271	97.04690812
180713A00013	7/13/2018	2.88	7/13/2023	7/13/2018	101.11438	100.5757347	100.0428374	99.51559309	98.99391193	98.47770602	97.9668893	97.4613775	96.96108812
180716A00016	7/16/2018	3.03	7/14/2023	7/16/2018	101.09296	100.5529691	100.0187514	99.49021266	98.96726249	98.44981246	97.93777599	97.43106831	96.92960642
180716A00054	7/16/2018	3.59	7/16/2040	7/16/2018	137.63776	119.70909	104.5124865	91.60677151	80.62466463	71.26004449	63.25745955	56.40348445	50.51958965
180717A00047	7/17/2018	3.3	9/17/2025	7/17/2018	107.14624	104.4204131	101.778237	99.21660511	96.73254753	94.32322568	91.98592566	89.71805174	87.5171202
180717A00076	7/17/2018	3.03	7/17/2023	7/17/2018	101.10594	100.5577853	100.0155734	99.47921088	98.94860338	98.42365848	97.90428575	97.39039668	96.88190464
180718A00026	7/18/2018	3.03	7/18/2023	7/18/2018	101.11027	100.5593917	100.0145158	99.47554656	98.942388	98.41494645	97.89313016	97.37684938	96.86601623
180719A00004	7/19/2018	3.07	7/19/2023	7/19/2018	101.13687	100.5831953	100.0355855	99.49393998	98.9581616	98.42815527	97.90382795	97.38508862	96.87184816
180719A00061	7/19/2018	3.07	7/19/2023	7/19/2018	101.13687	100.5831953	100.0355855	99.49393998	98.9581616	98.42815527	97.90382795	97.38508862	96.87184816
180719A00063	7/19/2018	3.21	7/19/2024	7/19/2018	103.42325	101.8806274	100.368674	98.88654812	97.43343468	96.00854785	94.61112982	93.24044954	91.89580151
180719A00064	7/19/2018	3.3	7/21/2025	7/19/2018	106.65018	104.0857022	101.5965366	99.18001803	96.83359553	94.55482456	92.34136167	90.1909597	88.10146308
180719A00065	7/19/2018	3.36	7/20/2026	7/19/2018	110.08904	106.4858927	103.0217302	99.69042823	96.48616377	93.40340242	90.43688227	87.58159881	84.83279089
180720A00068	7/20/2018	2.89	7/20/2023	7/20/2018	101.15123	100.5934514	100.0418261	99.49625469	98.95663764	98.42287773	97.8948798	97.37255075	96.85579947
180724A00075	7/24/2018	2.98	7/24/2023	7/24/2018	101.22059	100.6517159	100.0892411	99.5330534	98.98304773	98.43912131	97.90117364	97.36910644	96.84282355
180727A00028	7/27/2018	3.25	7/27/2026	7/27/2018	110.54517	106.8943523	103.3853417	100.0118382	96.76786195	93.64773189	90.64604868	87.75767913	84.97774144
180727A00037	7/27/2018	3.13	7/27/2023	7/27/2018	101.20712	100.6315573	100.0625371	99.4999448	98.94367202	98.3936127	97.84966316	97.31172203	96.77969015
180727A00038	7/27/2018	3.36	7/25/2025	7/27/2018	106.84	104.2620736	101.7600617	99.33126992	96.9731187	94.68313648	92.45895439	90.29830121	88.19899873
180727A00039	7/27/2018	3.48	7/27/2028	7/27/2018	116.74167	110.9788451	105.542414	100.412105	95.56901302	90.99549872	86.67509744	82.59243472	78.73314853
180730A00004	7/30/2018	3.14	7/28/2023	7/30/2018	101.21754	100.6392389	100.0675385	99.5023247	98.94348751	98.39091955	97.84451579	97.30417351	96.76979231
180730A00023	7/30/2018	3.13	7/30/2024	7/30/2018	103.70228	102.1219105	100.573373	99.05577629	97.56825884	96.10999103	94.68017347	93.27803561	91.90283446

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180730A00041	7/30/2018	3.14	7/31/2023	7/30/2018	101.23105	100.6445902	100.0649182	99.4919129	98.92545989	98.36544728	97.81176575	97.26430843	96.72297085
180730A00078	7/30/2018	3.14	7/28/2023	7/30/2018	101.21754	100.6392389	100.0675385	99.5023247	98.94348751	98.39091955	97.84451579	97.30417351	96.76979231
180730A00081	7/30/2018	3.5	7/28/2028	7/30/2018	116.85922	111.090414	105.6484203	100.5129388	95.66503432	91.08704017	86.76246637	82.67591528	78.81300352
180731A00004	7/31/2018	2.97	7/31/2023	7/31/2018	101.24747	100.659517	100.078382	99.50394919	98.93610314	98.37473102	97.81972256	97.27097001	96.72836803
180801A00015	8/1/2018	3.16	8/1/2023	8/1/2018	101.24714	100.6579298	100.0755683	99.49993667	98.93091896	98.36840163	97.81227377	97.26242699	96.71875533
180802A00006	8/2/2018	2.99	8/2/2023	8/2/2018	101.268	100.674559	100.0880681	99.50840634	98.9354549	98.3690977	97.80922129	97.25571484	96.70847002
180808A00009	8/8/2018	3.12	8/7/2023	8/8/2018	101.24857	100.6431556	100.0449842	99.45392256	98.86984436	98.29262624	97.72214772	97.15829116	96.60094161
180810A00028	8/10/2018	2.91	8/10/2023	8/10/2018	101.25348	100.6384332	100.030864	99.43063434	98.83761155	98.25166619	97.67267188	97.10050526	96.53504587
180813A00026	8/13/2018	2.87	8/11/2023	8/13/2018	101.2328	100.6151207	100.0049851	99.40225283	98.80678952	98.21846398	97.63714822	97.06271729	96.49504918
180813A00059	8/13/2018	3.01	8/11/2023	8/13/2018	101.19711	100.5810883	99.97257051	99.37141666	98.77749351	98.19067098	97.61082213	97.03782301	96.47155261
180814A00010	8/14/2018	3.1	8/14/2025	8/14/2018	106.89467	104.250235	101.685098	99.19639033	96.78136568	94.43739568	92.16196376	89.95265954	87.80717358
180814A00032	8/14/2018	3.1	8/14/2025	8/14/2018	106.89467	104.250235	101.685098	99.19639033	96.78136568	94.43739568	92.16196376	89.95265954	87.80717358
180814A00033	8/14/2018	3.25	8/13/2027	8/14/2018	114.18602	109.4056782	104.8562769	100.5253904	96.40133441	92.47311362	88.73037718	85.16337723	81.76293039
180815A00021	8/15/2018	3.01	8/15/2023	8/15/2018	101.21888	100.5919295	99.97274531	99.36118539	98.75710939	98.16038035	97.57086465	96.98843189	96.41295479
180816A00024	8/16/2018	3.01	8/16/2023	8/16/2018	101.2228	100.5931351	99.97130931	99.35717276	98.75058323	98.15140204	97.5594939	96.97472678	96.39697184
180816A00038	8/16/2018	3.38	8/16/2028	8/16/2018	116.29611	110.4918289	105.0191663	99.85735984	94.98705464	90.39020287	86.04996853	81.95063963	78.0775473
180817A00022	8/17/2018	2.87	8/17/2023	8/17/2018	101.25699	100.6230126	99.99697324	99.37872717	98.76812932	98.16503817	97.56931568	96.98082718	96.39944128
180820A00036	8/20/2018	3	8/21/2023	8/20/2018	101.23589	100.5927165	99.95771326	99.33072539	98.7116017	98.10019477	97.49636084	96.89995971	96.31085463
180820A00054	8/20/2018	3	8/18/2023	8/20/2018	101.22423	100.589176	99.96209136	99.3428259	98.73123384	98.12717303	97.53050481	96.9410939	96.35880833
180820A00055	8/20/2018	3.37	8/21/2028	8/20/2018	116.26711	110.4502979	104.9665082	99.79484723	94.91584237	90.31133885	85.96440337	81.85923545	77.98108563
180823A00013	8/23/2018	2.97	8/23/2023	8/23/2018	101.22407	100.5755536	99.9353447	99.30328201	98.67921065	98.06297966	97.45444188	96.8534538	96.25987545
180823A00033	8/23/2018	2.85	8/23/2023	8/23/2018	101.26812	100.6178944	99.97601402	99.34232129	98.71666008	98.09887826	97.48882751	96.88636323	96.29134442
180823A00035	8/23/2018	3.05	8/22/2025	8/23/2018	106.83035	104.165382	101.5808239	99.07374401	96.64133975	94.28092974	91.98994758	89.76593604	87.60654159
180823A00053	8/23/2018	3.2	8/23/2028	8/23/2018	116.64628	110.7677822	105.227357	100.0037124	95.07700866	90.42875363	86.04170406	81.89977448	77.9879534
180823A00055	8/23/2018	3.44	8/23/2033	8/23/2018	129.33283	118.0349334	107.86322	98.6981098	90.43334849	82.97445744	76.23737176	70.14724233	64.63738115
180827A00010	8/27/2018	2.99	8/25/2023	8/27/2018	101.24485	100.590881	99.94534993	99.30809751	98.67896511	98.05779822	97.444444619	96.83876216	96.24060293
180827A00020	8/27/2018	3.21	8/27/2025	8/27/2018	106.72847	104.0639571	101.4799037	98.97337523	96.54156336	94.18178147	91.89145838	89.66813253	87.50944645
180828A00032	8/28/2018	3.49	8/29/2033	8/28/2018	129.88754	118.5455941	108.3349333	99.13532733	90.83995841	83.3538586	76.59253806	70.48077829	64.95157005
180829A00008	8/29/2018	3.23	8/30/2027	8/29/2018	114.24074	109.4127505	104.8199042	100.4494486	96.28939696	92.32847544	88.55607671	84.96221661	81.53749396
180830A00039	8/30/2018	3.03	8/30/2023	8/30/2018	101.29106	100.6234644	99.96465516	99.31445765	98.67270394	98.03923042	97.41387768	96.79649039	96.18691713
180831A00016	8/31/2018	2.99	8/31/2023	8/31/2018	101.26823	100.598033	99.93669151	99.28403176	98.63988366	98.00408157	97.37646409	96.75687399	96.14515801
180831A00019	8/31/2018	3.21	9/2/2025	8/31/2018	106.77795	104.0968741	101.4971334	98.97574518	96.52985685	94.15674008	91.85378452	89.61849178	87.44846972
180904A00004	9/4/2018	2.89	9/5/2023	9/4/2018	101.34874	100.6631338	99.98679799	99.3195465	98.66119708	98.01157227	97.37049935	96.7378101	96.11334072

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180904A00012	9/4/2018	3.35	9/4/2030	9/4/2018	121.91022	113.8403674	106.3769626	99.47095235	93.07750277	87.15561755	81.66778992	76.57968828	71.85987159
180904A00014	9/4/2018	3.37	9/1/2028	9/4/2018	116.3264	110.4786509	104.9671659	99.77075665	94.86968257	90.24554498	85.88118865	81.76061103	77.86887869
180910A00007	9/10/2018	2.96	9/8/2023	9/10/2018	101.41051	100.7165788	100.0321399	99.35700358	98.69098092	98.03388804	97.38554603	96.7457807	96.11442248
180910A00013	9/10/2018	3.08	9/11/2023	9/10/2018	101.37658	100.6763975	99.98588815	99.3048512	98.63309248	97.97042313	97.31665935	96.67162229	96.03513787
180910A00028	9/10/2018	3.56	9/9/2033	9/10/2018	130.67749	119.2663988	108.9951433	99.74235829	91.40024734	83.87299672	77.07538502	70.93156067	65.37396633
180910A00032	9/10/2018	3.22	9/10/2024	9/10/2018	103.84306	102.1562115	100.5048094	98.88780134	97.30417525	95.75295891	94.23321798	92.74405414	91.28460333
180910A00033	9/10/2018	3.43	9/8/2028	9/10/2018	116.70351	110.8266177	105.2884693	100.067667	95.14427681	90.49972364	86.11669125	81.97903013	78.07167266
180912A00011	9/12/2018	3.41	9/11/2026	9/12/2018	110.77221	107.0138313	103.404947	99.93875305	96.60879374	93.4089452	90.33339627	87.37663045	84.53340896
180913A00029	9/13/2018	3.11	9/13/2023	9/13/2018	101.40656	100.7008917	100.0050425	99.31881148	98.64200011	97.97441512	97.31586856	96.66617754	96.02516412
180913A00030	9/13/2018	3.33	9/12/2025	9/13/2018	107.18508	104.4719684	101.8417861	99.29146376	96.81806921	94.41879944	92.09097388	89.83202806	87.63950768
180914A00008	9/14/2018	3.15	9/14/2023	9/14/2018	101.43953	100.7310381	100.0324485	99.34355107	98.66414477	97.99403421	97.33302933	96.68094522	96.03760195
180914A00013	9/14/2018	3.48	9/14/2028	9/14/2018	117.02043	111.1186893	105.5578272	100.316258	95.37388095	90.71196934	86.31306845	82.16090245	78.24028832
180914A00026	9/14/2018	3.15	9/14/2023	9/14/2018	101.43953	100.7310381	100.0324485	99.34355107	98.66414477	97.99403421	97.33302933	96.68094522	96.03760195
180914A00028	9/14/2018	3.37	9/12/2025	9/14/2018	107.29336	104.5787689	101.9471422	99.395409	96.92063589	94.52001889	92.19087647	89.93064323	87.73686398
180914A00029	9/14/2018	3.48	9/14/2028	9/14/2018	117.02043	111.1186893	105.5578272	100.316258	95.37388095	90.71196934	86.31306845	82.16090245	78.24028832
180917A00032	9/17/2018	3.17	9/15/2023	9/17/2018	101.45838	100.7471284	100.0458539	99.35434484	98.67239809	97.99981605	97.33640653	96.68198259	96.03636235
180917A00054	9/17/2018	3.17	9/15/2023	9/17/2018	101.45838	100.7471284	100.0458539	99.35434484	98.67239809	97.99981605	97.33640653	96.68198259	96.03636235
180917A00078	9/17/2018	3.05	9/15/2023	9/17/2018	101.50657	100.7933869	100.0902297	99.39688722	98.71315474	98.03883317	97.37372891	96.71765366	96.07042419
180918A00011	9/18/2018	3.17	9/18/2023	9/18/2018	101.4721	100.7527409	100.0435823	99.34440844	98.65500943	97.97518105	97.30472478	96.64344757	95.99116164
180918A00023	9/18/2018	3.17	9/18/2023	9/18/2018	101.4721	100.7527409	100.0435823	99.34440844	98.65500943	97.97518105	97.30472478	96.64344757	95.99116164
180918A00041	9/18/2018	3.18	9/18/2024	9/18/2018	104.20058	102.4830968	100.8021344	99.15658988	97.54540784	95.96757509	94.42211852	92.9081031	91.42462995
180920A00014	9/20/2018	3.59	9/20/2028	9/20/2018	117.68164	111.7453395	106.1524586	100.8812088	95.91130275	91.22384281	86.80121787	82.62700885	78.6859015
180920A00028	9/20/2018	3.12	9/20/2023	9/20/2018	101.58149	100.8545332	100.1379856	99.43162283	98.73522857	98.04859265	97.37151077	96.70378427	96.04522001
180920A00062	9/20/2018	3.12	9/20/2023	9/20/2018	101.58149	100.8545332	100.1379856	99.43162283	98.73522857	98.04859265	97.37151077	96.70378427	96.04522001
180924A00052	9/24/2018	3.22	9/22/2023	9/24/2018	101.52719	100.7968752	100.0770622	99.36752976	98.66805859	97.97843563	97.29845378	96.62791172	95.9666137
180925A00060	9/25/2018	3.23	8/25/2023	9/25/2018	101.40296	100.7484021	100.1022928	99.46446749	98.83476738	98.21303788	97.5991283	96.9928917	96.3941848
180926A00031	9/26/2018	3.24	9/26/2023	9/26/2018	101.56099	100.8197958	100.0894187	99.36961912	98.66016841	97.96084446	97.2714315	96.59171984	95.92150568
181004A00028	10/4/2018	3.31	10/4/2023	10/4/2018	101.65459	100.8915408	100.1399422	99.39953838	98.6700805	97.951327	97.24304341	96.54500206	95.85698185
181004A00029	10/4/2018	3.7	10/4/2028	10/4/2018	118.39555	112.4013506	106.7556334	101.4361861	96.42233375	91.69482326	87.23571741	83.02829785	79.05697574
181005A00005	10/5/2018	3.31	10/5/2023	10/5/2018	101.65996	100.8942032	100.1399794	99.39702997	98.66510318	97.94395497	97.23334836	96.53305332	95.84284643
181005A00011	10/5/2018	3.2	10/5/2023	10/5/2018	101.71958	100.9516548	100.1953236	99.45032363	98.71640155	97.99331141	97.28081454	96.57867921	95.88668044
181005A00012	10/5/2018	3.33	10/4/2024	10/5/2018	104.6032	102.8392169	101.1134597	99.42477004	97.77203895	96.15420168	94.5702355	93.01915754	91.50002286
181005A00016	10/5/2018	3.26	1/10/2023	10/5/2018	100.09258	100.0620101	100.0314745	100.0009739	99.97050833	99.94007762	99.90968175	99.87932065	99.84899426

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
181005A00017	10/5/2018	3.27	4/11/2023	10/5/2018	100.67975	100.3974452	100.1167315	99.83759752	99.56002974	99.28401498	99.00954015	98.73659231	98.46515866
181010A00021	10/10/2018	3.29	3/15/2023	10/10/2018	100.5228	100.3150312	100.108129	99.90209173	99.69691382	99.49258988	99.28911454	99.08648248	98.8846884
181010A00023	10/10/2018	3.41	4/1/2024	10/10/2018	102.84639	101.5971496	100.3775759	99.18661672	98.02326977	96.88657912	95.77563263	94.68955945	93.62752769
181015A00024	10/15/2018	3.29	10/16/2023	10/15/2018	101.703	100.9075496	100.1245464	99.35369903	98.59472584	97.84735369	97.11131777	96.3863613	95.67223522
181016A00087	10/16/2018	3.31	10/16/2023	10/16/2018	101.71904	100.9235174	100.1404444	99.36952808	98.61048666	97.863047	97.1269443	96.40192177	95.68773032
181018A00011	10/18/2018	3.35	10/18/2023	10/18/2018	101.76208	100.9610066	100.1725523	99.39641836	98.6323173	97.87997058	97.13910822	96.40946842	95.69079732
181023A00021	10/23/2018	3.28	10/23/2023	10/23/2018	101.72391	100.9097233	100.1085684	99.32013475	98.544121	97.78023511	97.02819421	96.28772412	95.55855912
181023A00025	10/23/2018	3.27	10/23/2023	10/23/2018	101.7157	100.9015488	100.1004303	99.31203275	98.53605463	97.77220399	97.02019793	96.27976232	95.55063142
181026A00002	10/26/2018	3.28	10/26/2023	10/26/2018	101.7397	100.9174096	100.1084081	99.31237367	98.52899634	97.75797582	96.9990213	96.25185102	95.51619194
181029A00081	10/29/2018	3.27	4/28/2023	10/29/2018	100.78423	100.4550582	100.1280368	99.80314104	99.48035026	99.1596441	98.84100246	98.52440546	98.20983353
181107A00008	11/7/2018	3.42	11/7/2023	11/7/2018	101.92546	101.0701905	100.2292776	99.40236423	98.5891027	97.78915662	97.00220063	96.22791986	95.46600958
181108A00025	11/8/2018	3.44	7/31/2023	11/8/2018	101.40799	100.8209453	100.2406863	99.66709895	99.10006861	98.53948337	97.98523387	97.43721315	96.89531669
181109A00027	11/13/2018	3.48	4/15/2024	11/13/2018	103.06203	101.7752894	100.5151243	99.28071098	98.07126415	96.88603047	95.72428717	94.5853404	93.46852378
181109A00028	11/9/2018	3.72	11/9/2026	11/9/2018	112.53269	108.5800229	104.7902834	101.1559108	97.66973111	94.32493818	91.11507325	88.03400526	85.07591257
181109A00029	11/9/2018	3.72	11/9/2026	11/9/2018	112.53269	108.5800229	104.7902834	101.1559108	97.66973111	94.32493818	91.11507325	88.03400526	85.07591257
181114A00014	11/14/2018	3.17	11/14/2023	11/14/2018	101.92021	101.0438452	100.182553	99.33594781	98.503656	97.68531637	96.88057988	96.08910901	95.31057738
181114A00021	11/14/2018	3.17	11/14/2023	11/14/2018	101.92021	101.0438452	100.182553	99.33594781	98.503656	97.68531637	96.88057988	96.08910901	95.31057738
181116A00015	11/19/2018	3.29	2/15/2024	11/19/2018	102.38976	101.2655164	100.1659692	99.09031344	98.03777591	97.0076165	95.99912642	95.01162654	94.04446584
181119A00018	11/19/2018	3.28	11/17/2023	11/19/2018	101.85973	100.9780194	100.1115826	99.26002041	98.4229518	97.60000865	96.79083526	95.99508775	95.21243365
181120A00024	11/20/2018	3.25	11/20/2023	11/20/2018	101.84928	100.9596139	100.0854894	99.22650472	98.38226878	97.55240373	96.73654456	95.93433858	95.14544481
181128A00031	11/28/2018	3.29	11/28/2023	11/28/2018	101.92943	101.0180118	100.1228842	99.24361556	98.37978719	97.53099482	96.69684824	95.87697063	95.07099802
181130A00037	11/30/2018	3.05	11/30/2023	11/30/2018	101.90079	100.9816294	100.0790331	99.19255499	98.32176626	97.46625307	96.62561606	95.79946969	94.98744163
181203A00053	12/4/2018	3.23	12/1/2023	12/4/2018	101.89049	100.9712566	100.0685993	99.1820725	98.31124646	97.45570674	96.61505334	95.78890012	94.97687419
181210A00015	12/10/2018	3.12	12/11/2023	12/10/2018	101.84072	100.8950582	99.96695936	99.05593335	98.16151191	97.28324372	96.42069373	95.57344239	94.74108497
181211A00009	12/11/2018	3.14	12/11/2023	12/11/2018	101.85983	100.9140744	99.98587841	99.07475652	98.18024042	97.30187877	96.4392365	95.59189402	94.7594466
181211A00018	12/11/2018	3.14	12/11/2023	12/11/2018	101.85983	100.9140744	99.98587841	99.07475652	98.18024042	97.30187877	96.4392365	95.59189402	94.7594466
181211A00031	12/11/2018	2.95	12/11/2023	12/11/2018	101.86668	100.9182387	99.98744542	99.07381307	98.17686998	97.2961616	96.43124975	95.58171194	94.74714062
181213A00031	12/13/2018	2.97	12/13/2023	12/13/2018	101.89657	100.942622	100.0065249	99.08778225	98.1859144	97.30045921	96.43097129	95.57702127	94.73819505
181217A00010	12/17/2018	3.11	12/15/2023	12/17/2018	101.86152	100.9049566	99.96636092	99.0452254	98.14106575	97.25341545	96.38182497	95.52586096	94.68510555
181218A00077	12/18/2018	3.09	12/18/2023	12/18/2018	101.85772	100.8931905	99.94692254	99.01840193	98.10713243	97.21263616	96.33445278	95.47213865	94.6252661
181219A00006	12/19/2018	3.06	12/19/2023	12/19/2018	101.83357	100.8665028	99.91779724	98.98693341	98.07341112	97.17674872	96.29648227	95.43216473	94.58336516
181227A00019	12/28/2020	3.1	12/29/2025	12/28/2020	107.43197	104.4245787	101.5180755	98.70851829	95.99214204	93.36534963	90.82470352	88.36691769	85.98885001
181227A00026	12/27/2018	3.03	12/27/2023	12/27/2018	101.84437	100.8559555	99.88671076	98.93608104	98.00353374	97.0885564	96.19065574	95.30935683	94.44420218

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
181227A00027	12/27/2018	3.24	12/26/2025	12/27/2018	107.82661	104.8214234	101.9167387	99.10863667	96.39337704	93.76738608	91.22724807	88.76969743	86.39161118
181227A00028	12/27/2018	3.46	12/27/2028	12/27/2018	117.45933	111.2646666	105.4439234	99.97249197	94.82750608	89.98771199	85.43334678	81.14602639	77.10864268
190102A00050	1/2/2019	3.38	1/3/2034	1/2/2019	129.25511	117.6152225	107.1711273	97.79212453	89.36248145	81.77964823	74.95269391	68.80093484	63.25273114
190102A00058	1/2/2019	2.91	1/2/2024	1/2/2019	101.75301	100.7491312	99.76503925	98.80015137	97.85390935	96.92577643	96.01523629	95.12179205	94.24496542
190103A00010	1/3/2019	2.7	1/3/2024	1/3/2019	101.7347	100.7255274	99.73633744	98.76654488	97.8155832	96.88290779	95.96799487	95.07034048	94.18945958
190104A00033	1/4/2019	3.37	1/31/2029	1/4/2019	117.09271	110.8155937	104.9225939	99.38809793	94.18833406	89.30122915	84.70627866	80.38442714	76.31795856
190107A00010	1/7/2019	2.66	1/9/2023	1/7/2019	100.06965	100.0418529	100.0140838	99.98634605	99.95863953	99.93096422	99.90332004	99.87570695	99.84812488
190107A00023	1/7/2019	2.87	1/6/2023	1/7/2019	100.05133	100.0318841	100.0124551	99.99304624	99.97365752	99.95428886	99.93494025	99.91561164	99.89630299
190107A00024	1/7/2019	2.91	1/5/2024	1/7/2019	101.76755	100.7556191	99.76379229	98.79147565	97.83809735	96.90310783	95.98597857	95.08620117	94.20328634
190108A00039	1/8/2019	3.04	4/30/2024	1/8/2019	102.60785	101.2857372	99.9868348	98.71058344	97.4564414	96.22388378	95.01240187	93.82150253	92.6507076
190110A00002	1/10/2019	2.93	1/10/2023	1/10/2019	100.0825	100.0519375	100.0214105	99.99091856	99.96046158	99.93003949	99.89965223	99.86929974	99.83898195
190110A00003	1/10/2019	2.97	1/10/2024	1/10/2019	101.85408	100.8283786	99.82332706	98.83830284	97.87271127	96.92598107	95.99756316	95.0869296	94.19357259
190110A00004	1/10/2019	3.09	1/10/2025	1/10/2019	104.57256	102.5521452	100.581163	98.65808985	96.78145761	94.94985366	93.16191839	91.41634272	89.71186595
190110A00005	1/10/2019	3.2	1/9/2026	1/10/2019	107.82466	104.7819586	101.8420308	99.00082544	96.254479	93.59930191	91.0317698	88.54851507	86.1463189
190110A00009	1/10/2019	2.97	1/16/2024	1/10/2019	101.88416	100.8423506	99.82184043	98.82197665	97.84213687	96.88172354	95.94016272	95.01690286	94.11141377
190110A00010	1/10/2019	2.97	1/16/2024	1/10/2019	101.88416	100.8423506	99.82184043	98.82197665	97.84213687	96.88172354	95.94016272	95.01690286	94.11141377
190110A00012	1/10/2019	2.97	1/18/2024	1/10/2019	101.89418	100.8470107	99.82135067	98.81654432	97.83195994	96.86699116	95.92105565	94.99359395	94.08406834
190110A00013	1/10/2019	2.97	1/17/2024	1/10/2019	101.88917	100.8446804	99.82159519	98.81925988	97.83704749	96.87435609	95.93060753	95.00524632	94.0977385
190110A00014	1/10/2019	2.97	1/17/2024	1/10/2019	101.88917	100.8446804	99.82159519	98.81925988	97.83704749	96.87435609	95.93060753	95.00524632	94.0977385
190111A00026	1/11/2019	3.48	1/11/2034	1/11/2019	130.37666	118.656767	108.1412158	98.69825997	90.21125709	82.57686578	75.70346538	69.50977069	63.92361676
190114A00040	1/14/2019	2.89	1/14/2025	1/14/2019	104.62624	102.5864394	100.5968532	98.65592147	96.76214294	94.91407353	93.11032381	91.34955649	89.63048403
190114A00042	1/14/2019	2.92	1/13/2023	1/14/2019	100.10461	100.0657162	100.0268696	99.98807083	99.94931974	99.91061626	99.87196029	99.83335174	99.79479052
190114A00061	1/14/2019	2.98	1/31/2024	1/14/2019	101.97049	100.8883848	99.82922371	98.79228004	97.77686	96.78229846	95.80795746	94.85322482	93.91751284
190115A00025	1/15/2019	2.96	1/12/2024	1/15/2019	101.85367	100.822657	99.81250853	98.8225924	97.85230483	96.90106583	95.96831809	95.05352586	94.15617391
190115A00034	1/15/2019	2.91	1/17/2023	1/15/2019	100.134	100.083997	100.0340614	99.98419274	99.93439092	99.88465578	99.83498718	99.78538499	99.73584907
190115A00063	1/15/2019	2.96	1/16/2024	1/15/2019	101.87361	100.8318646	99.81141299	98.81160693	97.83182406	96.87146685	95.92996138	95.00675611	94.10132089
190122A00007	1/22/2019	3.03	1/22/2024	1/22/2019	101.9785	100.9202275	99.88391061	98.86886855	97.87445077	96.90003299	95.94501591	95.00882399	94.09090425
190122A00008	1/22/2019	2.98	1/20/2023	1/22/2019	100.16042	100.1020792	100.0438258	99.98565546	99.92756785	99.86956282	99.81164019	99.75379979	99.69604145
190122A00042	1/22/2019	2.79	1/23/2023	1/22/2019	100.17583	100.1091223	100.0425118	99.97600218	99.90959328	99.84328484	99.77707665	99.71096846	99.64496004
190122A00043	1/22/2019	2.96	1/22/2025	1/22/2019	104.83445	102.7711307	100.7589254	98.79623472	96.8815179	95.01329348	93.19013666	91.41067667	89.67359429
190122A00045	1/22/2019	3.17	1/22/2027	1/22/2019	111.95481	107.7873758	103.8004503	99.98523208	96.33339815	92.83707482	89.48881106	86.28155336	83.20862224
190122A00046	1/22/2019	3.29	1/22/2029	1/22/2019	117.99233	111.6607165	105.716471	100.1337789	94.88867515	89.95890632	85.32379955	80.96414227	76.86207169
190128A00035	1/28/2019	3.04	1/26/2024	1/28/2019	102.01003	100.9409657	99.89429122	98.86931052	97.86535407	96.88177961	95.91797082	94.97333601	94.04730692

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190130A00019	1/30/2019	3.01	1/30/2024	1/30/2019	101.99807	100.9184614	99.86168389	98.82701744	97.81377342	96.82129153	95.84893834	94.89610597	93.96221081
190130A00020	1/30/2019	2.97	4/17/2023	1/30/2019	100.62378	100.3251415	100.0282822	99.73318917	99.43984653	99.14823869	98.85835022	98.57016588	98.2836706
190131A00019	1/31/2019	3.44	1/30/2034	1/31/2019	130.0204	118.2702178	107.7328533	98.27509266	89.77905572	82.14035638	75.26649342	69.07544045	63.49440965
190131A00036	1/31/2019	2.69	7/31/2023	1/31/2019	101.08221	100.4948105	99.91422488	99.3403369	98.77303116	98.21219493	97.65771799	97.10949267	96.56741367
190131A00053	1/31/2019	2.67	1/31/2023	1/31/2019	100.22197	100.1330432	100.0442763	99.95566814	99.86721823	99.77892619	99.69079159	99.602814	99.51499301
190206A00013	2/6/2019	2.68	2/6/2023	2/6/2019	100.25412	100.148536	100.0431869	99.93807018	99.83318495	99.72853045	99.62410588	99.51991045	99.41594336
190208A00005	2/8/2019	2.63	2/8/2023	2/8/2019	100.25898	100.1478582	100.0369906	99.92638112	99.81602874	99.70593254	99.59609159	99.48650495	99.37717171
190208A00008	2/8/2019	2.86	2/8/2024	2/8/2019	101.87804	100.7752556	99.69632498	98.6404764	97.60697464	96.59511543	95.60422382	94.63365269	93.68278132
190208A00009	2/8/2019	2.67	2/8/2024	2/8/2019	101.87497	100.7691099	99.68721394	98.62851194	97.59226373	96.57776036	95.58432248	94.6112988	93.65806461
190211A00002	2/11/2019	2.88	2/12/2024	2/11/2019	101.92012	100.8064913	99.71717399	98.65138146	97.60835723	96.58737702	95.58774698	94.60880214	93.64990489
190211A00016	2/11/2019	3.01	2/11/2025	2/11/2019	104.66026	102.5521064	100.4969815	98.49318781	96.53909615	94.63314191	92.77382178	90.95969086	89.1893599
190211A00017	2/11/2019	3.12	2/11/2026	2/11/2019	107.86123	104.7280417	101.7030253	98.78182154	95.96027123	93.23440792	90.60044775	88.05477982	85.59395713
190212A00017	2/12/2019	2.86	6/30/2023	2/12/2019	100.94666	100.4450767	99.94846609	99.45675286	98.96986495	98.48773168	98.01028375	97.53745321	97.06917339
190213A00023	2/13/2019	2.93	2/13/2024	2/13/2019	101.98162	100.8649703	99.77275538	98.70418072	97.65848444	96.63493711	95.63284006	94.65152369	93.69034609
190214A00006	2/14/2019	2.67	2/14/2024	2/14/2019	101.90429	100.78229	99.68495796	98.61148492	97.56109875	96.53306031	95.52666174	94.5412248	93.57609936
190214A00008	2/14/2019	2.64	2/14/2023	2/14/2019	100.29069	100.1629196	100.0354876	99.90839443	99.78163878	99.65521923	99.52913441	99.40338294	99.27796346
190214A00013	2/14/2019	2.64	2/14/2023	2/14/2019	100.29069	100.1629196	100.0354876	99.90839443	99.78163878	99.65521923	99.52913441	99.40338294	99.27796346
190215A00004	2/15/2019	2.84	2/15/2023	2/15/2019	100.30252	100.1721605	100.0421555	99.91250064	99.78319458	99.65423587	99.52562308	99.3973548	99.2694296
190215A00005	2/15/2019	2.89	2/15/2024	2/15/2019	101.93509	100.8135847	99.71673865	98.64374306	97.59382574	96.56624758	95.56030073	94.575307	93.6106163
190215A00006	2/15/2019	2.89	2/15/2024	2/15/2019	101.93509	100.8135847	99.71673865	98.64374306	97.59382574	96.56624758	95.56030073	94.575307	93.6106163
190215A00017	2/15/2019	2.89	2/15/2024	2/15/2019	101.93509	100.8135847	99.71673865	98.64374306	97.59382574	96.56624758	95.56030073	94.575307	93.6106163
190215A00046	2/15/2019	2.7	2/15/2024	2/15/2019	101.94332	100.8184228	99.71831596	98.64218248	97.58924477	96.55875854	95.55001108	94.56231956	93.5950295
190220A00007	2/20/2019	2.87	2/20/2024	2/20/2019	101.93675	100.8020017	99.69249021	98.60738218	97.54587861	96.50721509	95.49065991	94.49551232	93.52110094
190222A00021	2/22/2019	2.95	8/21/2024	2/22/2019	103.23908	101.6101574	100.0147336	98.45183628	96.92053355	95.41992899	93.94916002	92.50739629	91.09383813
190225A00026	2/25/2019	3.43	2/27/2034	2/25/2019	130.03962	118.2117838	107.6124371	98.10582832	89.57192094	81.90450163	75.00952166	68.8036451	63.212977
190227A00005	2/27/2019	2.87	2/27/2024	2/27/2019	101.97091	100.8174346	99.69001773	98.5877863	97.50990318	96.45556801	95.4240152	94.41451199	93.42635679
190301A00012	3/1/2019	3.41	3/1/2029	3/1/2019	117.49378	111.1230326	105.1464609	99.53749155	94.27148293	89.32557438	84.67854822	80.31070304	76.20373747
190308A00007	3/8/2019	2.8	3/8/2024	3/8/2019	101.93864	100.7588967	99.6064222	98.48028186	97.37958035	96.30346252	95.25111117	94.22174502	93.21461666
190314A00027	3/22/2019	2.92	3/21/2025	3/22/2019	104.76474	102.5504167	100.3938513	98.29311905	96.24637258	94.25184158	92.3078287	90.41270591	88.56491102
190315A00014	3/15/2019	2.74	3/15/2024	3/15/2019	101.91287	100.7145885	99.54444466	98.40145764	97.28468975	96.19324606	95.12627197	94.08295094	93.06250246
190318A00008	3/18/2019	2.76	3/18/2024	3/18/2019	101.95204	100.7455659	99.56761258	98.41717259	97.29328989	96.19505229	95.121589	94.07206826	93.04569519
190318A00021	3/18/2019	2.76	3/18/2024	3/18/2019	101.95204	100.7455659	99.56761258	98.41717259	97.29328989	96.19505229	95.121589	94.07206826	93.04569519
190321A00003	3/21/2019	2.67	3/21/2024	3/21/2019	101.85594	100.6421662	99.45726919	98.30022887	97.17007118	96.065867	94.98672958	93.9318122	92.90030588

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190326A00003	3/26/2019	2.57	3/27/2023	3/26/2019	100.41758	100.1769701	99.93751481	99.6992039	99.46202918	99.22598255	98.99105603	98.75724165	98.52453158
190326A00004	3/26/2019	2.58	9/26/2023	3/26/2019	101.06803	100.3288756	99.60050995	98.8827012	98.17522102	97.47784767	96.79036568	96.11256572	95.44424428
190326A00024	3/26/2019	2.59	3/26/2024	3/26/2019	101.77974	100.553262	99.35627548	98.18772868	97.04661694	95.93198243	94.84291145	93.77853191	92.738011
190326A00032	3/26/2019	2.4	3/26/2024	3/26/2019	101.77662	100.5465634	99.3461477	98.17431156	97.03004365	95.91237985	94.82040054	93.75322802	92.71002421
190327A00006	3/27/2019	2.53	3/27/2024	3/27/2019	101.70928	100.4806272	99.28158221	98.11108797	96.96813379	95.85175622	94.76103628	93.69509693	92.65310071
190327A00013	3/27/2019	2.53	3/27/2024	3/27/2019	101.70928	100.4806272	99.28158221	98.11108797	96.96813379	95.85175622	94.76103628	93.69509693	92.65310071
190327A00031	3/27/2019	2.53	3/27/2024	3/27/2019	101.70928	100.4806272	99.28158221	98.11108797	96.96813379	95.85175622	94.76103628	93.69509693	92.65310071
190327A00032	3/27/2019	2.53	1/26/2024	3/27/2019	101.45823	100.3923462	99.34880466	98.32691156	97.3259984	96.34542399	95.38457302	94.4428548	93.51970201
190328A00003	3/28/2019	2.64	9/30/2024	3/28/2019	102.99886	101.2666757	99.5717625	97.91298262	96.28924463	94.69950148	93.14274821	91.61801978	90.12438902
190328A00019	3/28/2019	2.56	3/28/2024	3/28/2019	101.75115	100.5195838	99.31775499	98.14460005	96.99910194	95.88029129	94.78724351	93.71907631	92.67494729
190328A00031	4/25/2019	2.56	4/25/2024	4/25/2019	101.9308	100.6262216	99.34587077	98.08910495	96.85530278	95.64386469	94.45421194	93.28578576	92.13804643
190328A00033	4/25/2019	2.56	4/25/2024	4/25/2019	101.9308	100.6262216	99.34587077	98.08910495	96.85530278	95.64386469	94.45421194	93.28578576	92.13804643
190328A00046	3/28/2019	2.7	3/4/2025	3/28/2019	104.15485	101.9935349	99.88771084	97.83555739	95.83533089	93.88535864	91.98403542	90.12982014	88.32123273
190328A00065	3/28/2019	2.56	3/28/2024	3/28/2019	101.75115	100.5195838	99.31775499	98.14460005	96.99910194	95.88029129	94.78724351	93.71907631	92.67494729
190328A00079	3/28/2019	2.37	3/28/2024	3/28/2019	101.748	100.5128301	99.30755208	98.131089	96.9824171	95.86056062	94.764589	93.6936143	92.64678875
190328A00083	3/28/2019	2.37	3/28/2024	3/28/2019	101.748	100.5128301	99.30755208	98.131089	96.9824171	95.86056062	94.764589	93.6936143	92.64678875
190329A00017	3/29/2019	2.59	3/29/2023	3/29/2019	100.42996	100.1838337	99.93891381	99.6951871	99.45264487	99.21127856	98.97107967	98.7320398	98.49415063
190329A00018	3/29/2019	2.6	3/29/2024	3/29/2019	101.80573	100.5711645	99.36646932	98.1905726	97.04245098	95.92112906	94.82567666	93.75520617	92.70887019
190401A00010	4/1/2019	2.62	4/1/2024	4/1/2019	101.84886	100.6062408	99.39317992	98.20862502	97.05157676	95.92108211	94.81623173	93.73615743	92.6800299
190402A00004	4/2/2019	2.9	4/2/2029	4/2/2019	115.93342	109.4694537	103.4131089	97.73644554	92.41358997	87.42056779	82.73515448	78.33673837	74.20619511
190403A00006	4/3/2019	2.48	4/3/2024	4/3/2019	101.92277	100.6708527	99.44819931	98.25378489	97.08663393	95.9458156	94.83044119	93.73966172	92.67266576
190404A00003	4/4/2019	2.47	4/4/2024	4/4/2019	101.91692	100.6624672	99.4370557	98.23967447	97.06936353	95.92520648	94.80632808	93.71189194	92.64109838
190409A00019	4/9/2019	2.91	4/9/2029	4/9/2019	116.02433	109.5389539	103.4636304	97.77020481	92.43260546	87.42667502	82.73002017	78.32187361	74.18296769
190409A00031	4/9/2019	2.64	4/9/2024	4/9/2019	101.92843	100.6647958	99.42893594	98.21993446	97.03691516	95.87903995	94.74550682	93.63554787	92.54842752
190409A00033	4/9/2019	2.62	6/9/2023	4/9/2019	100.75177	100.3077915	99.86772585	99.43152426	98.99913583	98.57051064	98.14559959	97.72435446	97.30672787
190411A00017	4/15/2019	2.65	4/15/2024	4/15/2019	101.98218	100.7028229	99.44991096	98.22262979	97.02019727	95.84186335	94.68690831	93.55464128	92.44439873
190424A00007	4/24/2019	2.66	4/24/2024	4/24/2019	102.0568	100.7538959	99.47546076	98.22082818	96.98936011	95.78044134	94.59347854	93.42789917	92.28315065
190424A00023	4/24/2019	2.43	4/24/2023	4/24/2019	100.55171	100.2333187	99.91694911	99.60258287	99.29020095	98.97978455	98.67131509	98.36477423	98.06014387
190426A00009	4/26/2019	2.63	4/26/2024	4/26/2019	102.03055	100.72272	99.43890912	98.17849188	96.94086283	95.72543735	94.53165075	93.35895738	92.20682988
190426A00016	5/1/2019	2.58	4/14/2023	5/1/2019	100.49433	100.2041703	99.91569265	99.62888568	99.34373488	99.06022584	98.77834436	98.49807635	98.21940793
190429A00003	4/29/2019	2.62	10/13/2023	4/29/2019	101.1475	100.3626153	99.58989985	98.82906993	98.07985265	97.34198345	96.61520576	95.8992707	95.19393678
190429A00004	4/29/2019	2.65	4/15/2024	4/29/2019	101.98218	100.7028229	99.44991096	98.22262979	97.02019727	95.84186335	94.68690831	93.55464128	92.44439873
190430A00001	4/30/2019	2.47	5/2/2024	4/30/2019	102.10677	100.778763	99.47421036	98.19254848	96.93322696	95.69571263	94.47948892	93.28405513	92.10892591

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190430A00003	4/30/2019	2.43	8/2/2023	4/30/2019	100.93439	100.342075	99.7567031	99.17815105	98.60630011	98.0410343	97.48224032	96.92980746	96.38362752
190501A00017	5/1/2019	2.61	5/1/2024	5/1/2019	102.03655	100.715742	99.41816732	98.14326464	96.89049095	95.65932014	94.44924236	93.25976336	92.09040394
190501A00028	5/1/2019	2.42	5/1/2024	5/1/2019	102.0335	100.7087287	99.407313	98.12869174	96.87231788	95.63766147	94.42420898	93.23146267	92.05893998
190507A00006	5/7/2019	2.57	5/8/2023	5/7/2019	100.59853	100.242328	99.88864852	99.53746802	99.18876004	98.84249847	98.49865757	98.15721196	97.81813662
190507A00027	5/7/2019	2.59	5/7/2024	5/7/2019	102.04406	100.7069621	99.39364023	98.1035163	96.83602873	95.5906336	94.36680397	93.16402924	91.9818145
190510A00018	5/10/2019	2.54	5/10/2023	5/10/2019	100.59244	100.2308205	99.87180138	99.51535879	99.16146494	98.8100925	98.46121451	98.11480442	97.77083602
190513A00013	5/13/2019	2.52	5/13/2024	5/13/2019	101.98204	100.6291557	99.30059393	97.99575263	96.71405149	95.45492866	94.21784009	93.00225875	91.80767403
190514A00020	5/14/2019	2.66	5/14/2025	5/14/2019	104.54792	102.1920215	99.90113564	97.673115	95.50589475	93.39748984	91.34599144	89.34956351	87.40643962
190514A00021	5/14/2019	2.72	11/14/2025	5/14/2019	105.97592	103.1107591	100.3381713	97.65467493	95.05694189	92.54178665	90.10615924	87.74713869	85.46192688
190514A00024	5/14/2019	2.34	5/14/2024	5/14/2019	101.99837	100.6385288	99.3032349	97.9918821	96.70388248	95.43866694	94.19568446	92.9744014	91.7743008
190514A00073	5/14/2019	2.53	5/14/2024	5/14/2019	102.00138	100.6456604	99.31435065	98.00685238	96.72258208	95.46097482	94.22148356	93.00357845	91.80674613
190517A00005	5/17/2019	2.31	5/17/2024	5/17/2019	101.97341	100.6056057	99.262626	97.94385316	96.64868964	95.37655718	94.12689599	92.89916402	91.69283626
190520A00007	5/20/2019	2.52	5/20/2024	5/20/2019	102.00704	100.6352799	99.28848648	97.96603358	96.66731862	95.39175846	94.13878864	92.90786262	91.69845105
190521A00043	5/21/2019	2.54	5/22/2023	5/21/2019	100.64152	100.2469815	99.85553412	99.4671455	99.08177984	98.69940189	98.31997697	97.94347092	97.5698501
190522A00003	5/22/2019	2.55	5/22/2024	5/22/2019	102.06013	100.6825865	99.33019663	98.00233309	96.6983867	95.41776796	94.15990634	92.92424943	91.71026232
190522A00017	5/23/2019	2.53	3/1/2023	5/23/2019	100.31413	100.1452094	99.97685276	99.8090599	99.641828	99.4751543	99.30903601	99.1434704	98.97845474
190522A00019	5/23/2019	2.55	5/15/2024	5/23/2019	102.02095	100.6625984	99.32874993	98.01879737	96.73215414	95.46825243	94.22654243	93.00649163	91.80758413
190523A00014	5/23/2019	2.5	11/15/2023	5/23/2019	101.15894	100.2859466	99.42799517	98.58470172	97.75569278	96.94060746	96.13909693	95.35082396	94.5754624
190523A00015	5/23/2019	2.51	4/1/2024	5/23/2019	101.70996	100.4682661	99.25611212	98.07244897	96.91627773	95.78664582	94.68264426	93.60340525	92.54809983
190523A00016	5/23/2019	2.48	2/15/2023	5/23/2019	100.25554	100.1252397	99.99528857	99.86568749	99.73643507	99.60752987	99.47897047	99.35075545	99.22288339
190523A00017	5/23/2019	2.51	3/15/2024	5/23/2019	101.63315	100.4366656	99.2682881	98.12703888	97.01198101	95.92222028	94.85690282	93.81521278	92.7963703
190523A00018	5/23/2019	2.51	3/15/2024	5/23/2019	101.63315	100.4366656	99.2682881	98.12703888	97.01198101	95.92222028	94.85690282	93.81521278	92.7963703
190523A00020	5/23/2019	2.5	2/9/2024	5/23/2019	101.4796	100.3765411	99.29741112	98.2414378	97.2078815	96.19603381	95.20521593	94.23477707	93.2840931
190523A00023	5/23/2019	2.48	3/22/2023	5/23/2019	100.3785	100.1516974	99.92592384	99.70117518	99.47744445	99.25472474	99.03300918	98.81229096	98.59256336
190524A00026	5/28/2019	2.45	6/15/2023	5/28/2019	100.69247	100.2323567	99.7764551	99.32470406	98.87704694	98.43342816	97.99379312	97.55808823	97.12626084
190524A00032	5/24/2019	2.45	5/24/2023	5/24/2019	100.61751	100.2175122	99.82069858	99.42702648	99.0364587	98.64895862	98.26449017	97.88301785	97.50450672
190524A00040	5/24/2019	2.47	5/24/2024	5/24/2019	101.97263	100.5901035	99.23291508	97.90042945	96.59203091	95.30712379	94.04513163	92.80549638	91.58767769
190528A00005	5/28/2019	2.42	6/15/2023	5/28/2019	100.67858	100.2185107	99.76264684	99.31093328	98.8633134	98.4197316	97.98013332	97.54446494	97.11267382
190528A00006	5/28/2019	2.43	9/15/2023	5/28/2019	100.92809	100.2189485	99.51976418	98.83032468	98.15042714	97.4798743	96.81847432	96.16604058	95.5223915
190528A00007	5/28/2019	2.44	11/15/2023	5/28/2019	101.10588	100.2331411	99.37544138	98.53239659	97.70363335	96.88879081	96.08752022	95.2994844	94.52435726
190528A00009	5/28/2019	2.45	5/15/2024	5/28/2019	101.88265	100.5252975	99.1924318	97.88344548	96.5977524	95.33478518	94.09399442	92.87484801	91.67683045
190528A00028	5/28/2019	2.42	5/30/2023	5/28/2019	100.62816	100.2117609	99.7987932	99.38921734	98.9829917	98.5800754	98.1804282	97.78401054	97.39078345
190529A00011	5/29/2019	2.36	5/30/2023	5/29/2019	100.60305	100.1867086	99.77380322	99.3642893	98.95812524	98.55527014	98.15568379	97.7593266	97.36615963

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190529A00013	5/29/2019	2.38	5/29/2024	5/29/2019	101.8577	100.4627518	99.09359522	97.74957215	96.43005121	95.13442161	93.86209245	92.61249183	91.38506618
190529A00023	5/29/2019	2.38	5/29/2024	5/29/2019	101.8577	100.4627518	99.09359522	97.74957215	96.43005121	95.13442161	93.86209245	92.61249183	91.38506618
190529A00028	5/29/2019	2.38	5/29/2024	5/29/2019	101.8577	100.4627518	99.09359522	97.74957215	96.43005121	95.13442161	93.86209245	92.61249183	91.38506618
190529A00031	5/29/2019	2.36	5/30/2023	5/29/2019	100.60305	100.1867086	99.77380322	99.3642893	98.95812524	98.55527014	98.15568379	97.7593266	97.36615963
190529A00032	5/29/2019	2.38	5/29/2024	5/29/2019	101.8577	100.4627518	99.09359522	97.74957215	96.43005121	95.13442161	93.86209245	92.61249183	91.38506618
190529A00089	5/29/2019	2.38	5/29/2024	5/29/2019	101.8577	100.4627518	99.09359522	97.74957215	96.43005121	95.13442161	93.86209245	92.61249183	91.38506618
190530A00004	5/30/2019	2.24	5/30/2023	5/30/2019	100.62742	100.2101543	99.79634356	99.38594207	98.97890785	98.57519965	98.17477684	97.77759948	97.38362826
190530A00006	5/30/2019	2.25	5/30/2024	5/30/2019	101.95937	100.5564139	99.179506	97.82798135	96.50119978	95.1985422	93.91940975	92.66322297	91.42942103
190530A00008	5/30/2019	2.38	5/30/2025	5/30/2019	104.49229	102.0831494	99.74182273	97.46602729	95.25356833	93.10233774	91.01031004	88.97553861	86.99615215
190530A00024	5/30/2019	2.25	5/30/2024	5/30/2019	101.95937	100.5564139	99.179506	97.82798135	96.50119978	95.1985422	93.91940975	92.66322297	91.42942103
190530A00029	5/30/2019	2.25	5/30/2024	5/30/2019	101.95937	100.5564139	99.179506	97.82798135	96.50119978	95.1985422	93.91940975	92.66322297	91.42942103
190530A00034	5/30/2019	2.44	5/30/2024	5/30/2019	101.94827	100.5499587	99.17753979	97.83035649	96.50777367	95.20917713	93.93397263	92.68158513	91.451458
190530A00045	5/30/2019	2.44	5/30/2024	5/30/2019	101.94827	100.5499587	99.17753979	97.83035649	96.50777367	95.20917713	93.93397263	92.68158513	91.451458
190531A00037	5/31/2019	2.61	5/31/2029	5/31/2019	114.31086	107.7395934	101.593485	95.84279191	90.45999924	85.41964125	80.69813886	76.27365092	72.12593781
190531A00038	5/31/2019	2.82	5/31/2034	5/31/2019	123.54295	111.8286604	101.3663335	92.01429107	83.64760526	76.15603862	69.44224884	63.420221	58.01389715
190603A00002	6/3/2019	2.03	6/2/2023	6/3/2019	100.54799	100.12273	99.70106472	99.28294769	98.86833417	98.45718023	98.04944267	97.64507899	97.24404742
190603A00003	6/3/2019	2.05	6/3/2024	6/3/2019	101.69272	100.2812821	98.89624238	97.53692277	96.20267001	94.89285255	93.60685967	92.34410054	91.10400346
190603A00005	6/3/2019	2.25	6/3/2024	6/3/2019	101.6963	100.2894453	98.90882798	97.55378255	96.223661	94.91783674	93.63570369	92.37667552	91.14018477
190603A00033	6/3/2019	2.05	6/3/2024	6/3/2019	101.69272	100.2812821	98.89624238	97.53692277	96.20267001	94.89285255	93.60685967	92.34410054	91.10400346
190603A00047	6/3/2019	2.22	6/2/2023	6/3/2019	100.54887	100.1245443	99.70378792	99.28656075	98.87281851	98.46251769	98.0556155	97.65206985	97.25183935
190604A00031	6/4/2019	2.25	6/5/2023	6/4/2019	100.5748	100.1421825	99.71328282	99.28805456	98.86645063	98.44842481	98.03393163	97.62292641	97.21536521
190605A00020	6/5/2019	2.19	2/5/2024	6/5/2019	101.10924	100.0191118	98.95241067	97.90839149	96.88633668	95.88555859	94.90539806	93.94522287	93.00442644
190606A00023	6/6/2019	2.23	6/6/2024	6/6/2019	101.68139	100.2668358	98.87880587	97.51662285	96.17962831	94.86718572	93.57867952	92.3135143	91.07111394
190606A00026	6/6/2019	2.23	6/6/2023	6/6/2019	100.56468	100.1294162	99.69791644	99.27013406	98.84602111	98.42553046	98.00861579	97.59523158	97.18533306
190606A00027	6/6/2019	2.51	6/5/2026	6/6/2019	106.75108	103.3270701	100.0317561	96.85962711	93.80543759	90.86419327	88.03113801	85.301741	82.67168494
190606A00028	6/6/2019	2.74	6/6/2029	6/6/2019	113.67808	107.167864	101.0783347	95.38008275	90.04589973	85.05060259	80.37087308	75.98511083	71.87329857
190606A00029	6/6/2019	2.96	6/6/2034	6/6/2019	122.45716	110.9412804	100.6518121	91.45029072	83.21458821	75.83691127	69.22205264	63.28586323	57.95391649
190607A00018	6/7/2019	2.19	6/7/2024	6/7/2019	101.62815	100.2113939	98.82125156	97.45704197	96.11810336	94.80379604	93.51350143	92.24662122	91.00257652
190613A00011	6/13/2019	2.26	6/13/2024	6/13/2019	101.75744	100.3240866	98.91795018	97.53832054	96.18451432	94.85587118	93.55175283	92.2715421	91.01464207
190617A00027	6/17/2019	2.21	6/16/2023	6/17/2019	100.58423	100.1216914	99.66341336	99.20933251	98.75939122	98.31353296	97.87170222	97.4338445	96.99990629
190618A00002	6/18/2019	2.11	6/18/2025	6/18/2019	103.94393	101.4917156	99.10996242	96.79624972	94.54825138	92.36373513	90.24055811	88.17666268	86.17007252
190619A00009	6/19/2019	2.26	6/19/2024	6/19/2019	101.78551	100.3363345	98.91496365	97.52066525	96.1527344	94.81049018	93.49327464	92.20045178	90.93140673
190620A00026	6/20/2019	2.09	6/20/2023	6/20/2019	100.53366	100.0604425	99.59168182	99.12731174	98.66727067	98.21149821	97.75993508	97.31252308	96.8692051

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190620A00027	6/20/2019	2.14	6/20/2024	6/20/2019	101.61241	100.161972	98.73940934	97.34399085	95.97500858	94.63177877	93.31364071	92.01995583	90.75010675
190620A00045	6/20/2019	2.14	6/20/2024	6/20/2019	101.61241	100.161972	98.73940934	97.34399085	95.97500858	94.63177877	93.31364071	92.01995583	90.75010675
190620A00055	6/25/2019	2.08	4/17/2023	6/25/2019	100.35718	100.0590531	99.76270787	99.46812655	99.17529335	98.88419267	98.5948091	98.30712741	98.02113256
190620A00056	6/25/2019	2.07	1/17/2023	6/25/2019	100.09201	100.0420414	99.99214178	99.94230913	99.89254324	99.84284399	99.79321123	99.74364482	99.69414464
190620A00057	6/25/2019	2.09	5/15/2023	6/25/2019	100.44321	100.0682603	99.69611334	99.32673915	98.96010679	98.59618572	98.23494587	97.8763576	97.52039171
190621A00015	6/21/2019	2.2	6/21/2024	6/21/2019	101.70581	100.2520547	98.82628351	97.42776274	96.05578056	94.70964942	93.38870504	92.09230539	90.8198298
190625A00012	6/25/2019	2.12	6/25/2024	6/25/2019	101.60426	100.140898	98.70590126	97.29851967	95.91802717	94.5637227	93.23492901	91.93099176	90.65127846
190625A00021	6/25/2019	1.88	6/26/2023	6/25/2019	100.54211	100.0514062	99.56549052	99.08428851	98.60773177	98.13575322	97.66828709	97.20526887	96.74663524
190625A00023	6/25/2019	2.47	6/25/2027	6/25/2019	109.24859	104.7441031	100.4526321	96.36299206	92.46464174	88.74764494	85.20263261	81.82076752	78.59371128
190625A00024	6/25/2019	2.26	6/25/2025	6/25/2019	103.83159	101.3735647	98.98647328	96.66786808	94.41539701	92.2268032	90.09992067	88.03266994	86.02305413
190626A00004	6/26/2019	2.15	6/26/2024	6/26/2019	101.65349	100.1871499	98.74927864	97.33912374	95.95595536	94.59906872	93.26778313	91.96144088	90.6794063
190626A00010	6/26/2019	2.1	6/26/2023	6/26/2019	100.55343	100.0638562	99.5790424	99.09891693	98.62341201	98.1524612	97.68599932	97.22396243	96.76628782
190626A00015	6/26/2019	2.15	6/26/2024	6/26/2019	101.65349	100.1871499	98.74927864	97.33912374	95.95595536	94.59906872	93.26778313	91.96144088	90.6794063
190627A00009	6/27/2019	1.93	6/27/2023	6/27/2019	100.56934	100.0758408	99.58717465	99.10327297	98.62406631	98.14948658	97.67946697	97.21394199	96.75284737
190627A00010	6/27/2019	1.97	6/27/2024	6/27/2019	101.68397	100.2098966	98.76456492	97.34721209	95.9570985	94.59351016	93.25575755	91.94317456	90.65511753
190628A00004	6/28/2019	2.12	6/28/2023	6/28/2019	100.5684	100.0733582	99.58317234	99.09777524	98.61709708	98.14106937	97.66962492	97.20269783	96.74022348
190701A00008	7/3/2019	2.1	7/3/2023	7/3/2019	100.56871	100.0601081	99.55664082	99.05822744	98.56479213	98.07626063	97.59256014	97.11361928	96.6393681
190701A00009	7/3/2019	2.14	7/2/2024	7/3/2019	101.66616	100.1839008	98.73066862	97.30568899	95.90821063	94.5375084	93.19288217	91.8736557	90.57917566
190701A00023	7/1/2019	1.95	7/1/2024	7/1/2019	101.67219	100.1876514	98.73223199	97.30515479	95.90566576	94.53303715	93.18656631	91.86557461	90.56940644
190702A00002	7/2/2019	2.16	7/2/2024	7/2/2019	101.69645	100.2139479	98.7604818	97.33527226	95.9375679	94.56664348	93.22179877	91.90235745	90.60766608
190703A00017	7/3/2019	2.33	5/4/2026	7/3/2019	105.92454	102.6005128	99.39858598	96.31364877	93.34083508	90.47550631	87.71323954	85.04981638	82.48121246
190708A00011	7/8/2019	2.2	7/8/2024	7/8/2019	101.78875	100.2892149	98.81921711	97.37795418	95.96465432	94.57857297	93.21899153	91.88521623	90.5765771
190709A00018	7/9/2019	2.24	7/9/2024	7/9/2019	101.85537	100.3525918	98.87943813	97.43510641	96.0188213	94.62983481	93.2674251	91.93089531	90.61957253
190710A00012	7/10/2019	2.18	7/10/2023	7/10/2019	100.62357	100.095867	99.57369265	99.05696144	98.54558846	98.0394906	97.53858645	97.04279629	96.55204199
190710A00022	7/10/2019	2.22	7/10/2024	7/10/2019	101.83005	100.3247511	98.84916033	97.40246635	95.98389058	94.59268193	93.22811561	91.88949196	90.57613542
190711A00019	7/11/2019	2.19	7/11/2023	7/11/2019	100.6309	100.1004668	99.57562265	99.05627776	98.54234592	98.03374271	97.5303855	97.03219332	96.53908688
190711A00022	7/11/2019	2	7/11/2023	7/11/2019	100.6347	100.1029771	99.57687396	99.05629958	98.54116697	98.03139096	97.52688818	97.02757696	96.53337732
190712A00001	7/12/2019	2.05	7/12/2024	7/12/2019	101.88344	100.3671866	98.88098769	97.42402236	95.9954987	94.59465294	93.22074829	91.87307368	90.55094264
190712A00009	7/12/2019	2.19	7/12/2023	7/12/2019	100.63291	100.0997649	99.57226756	99.05032565	98.53385161	98.02275973	97.51696611	97.01638857	96.52094663
190712A00018	7/12/2019	2.25	7/12/2024	7/12/2019	101.88698	100.3757959	98.89448858	97.44224287	96.01827314	94.62182171	93.25215751	91.90857493	90.59039275
190715A00010	7/15/2019	2.23	7/15/2024	7/15/2019	101.87226	100.3530424	98.8639486	97.40415094	95.97285373	94.56928966	93.19271856	91.8424262	90.51772314
190717A00008	7/17/2019	2.22	7/17/2024	7/17/2019	101.86745	100.3428371	98.8485153	97.38364742	95.94743093	94.53909207	93.15788458	91.80308841	90.47400861
190719A00006	7/19/2019	2.17	7/19/2024	7/19/2019	101.80009	100.2706005	98.77154977	97.30210257	95.86144982	94.44881153	93.06343551	91.70459611	90.37159305

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190724A00021	7/24/2019	2.33	7/23/2027	7/24/2019	109.78485	105.162328	100.7621534	96.57245453	92.58205531	88.78043278	85.15767521	81.70444323	78.41193375
190724A00023	7/24/2019	2.13	7/24/2025	7/24/2019	104.21219	101.6594808	99.18235189	96.77811473	94.44419301	92.17811851	89.97752584	87.84014738	85.76380857
190724A00024	7/24/2019	2.49	7/24/2029	7/24/2019	113.70623	107.0113604	100.7588987	94.9172598	89.4572711	84.35197746	79.57646179	75.10768086	70.92431521
190724A00025	7/24/2019	1.96	7/24/2023	7/24/2019	100.63829	100.0713263	99.51073698	98.95641962	98.40826935	97.8661836	97.33006205	96.79980661	96.27532132
190726A00017	7/26/2019	2.44	7/24/2026	7/26/2019	106.84731	103.2908413	99.87247669	96.58609567	93.42588765	90.38633116	87.46217765	84.64843639	81.94036021
190729A00007	7/29/2019	2.17	7/28/2023	7/29/2019	100.65344	100.0770041	99.50715325	98.94377394	98.38675644	97.83599351	97.29138032	96.75281437	96.22019542
190729A00008	7/29/2019	2.18	1/29/2024	7/29/2019	101.08809	100.0164146	98.96737873	97.94027335	96.93441641	95.94915392	94.98385849	94.03792795	93.11078416
190730A00007	7/30/2019	2.19	7/30/2024	7/30/2019	101.88918	100.3291104	98.8004239	97.30223731	95.83370315	94.39400508	92.98235638	91.5979987	90.2402007
190730A00016	7/30/2019	2	7/30/2024	7/30/2019	101.90172	100.3362008	98.80225881	97.29900186	95.82557544	94.38115659	92.96495233	91.57619832	90.21415753
190731A00004	7/31/2019	2.18	7/31/2024	7/31/2019	101.87832	100.3157161	98.78458117	97.28402677	95.81320197	94.37128709	92.95749228	91.5710562	90.21124468
190801A00010	8/1/2019	1.97	8/1/2023	8/1/2019	100.6588	100.0701211	99.4883081	98.91324404	98.34481204	97.78289787	97.22738992	96.67817912	96.13515885
190802A00003	8/2/2019	2.01	8/2/2024	8/2/2019	101.61658	100.0509036	98.51682538	97.01345514	95.53993585	94.09544207	92.67917852	91.29037872	89.92830365
190802A00032	8/2/2019	2.01	8/2/2024	8/2/2019	101.61658	100.0509036	98.51682538	97.01345514	95.53993585	94.09544207	92.67917852	91.29037872	89.92830365
190805A00008	8/5/2019	1.88	8/4/2023	8/5/2019	100.49095	99.89621105	99.30849797	98.72768273	98.15364444	97.58626499	97.02542901	96.47102379	95.92293919
190805A00009	8/5/2019	1.91	8/5/2024	8/5/2019	101.46961	99.89730261	98.35683252	96.84729715	95.36782928	93.9175939	92.49578668	91.10163254	89.73438434
190805A00011	8/5/2019	1.91	8/5/2024	8/5/2019	101.46961	99.89730261	98.35683252	96.84729715	95.36782928	93.9175939	92.49578668	91.10163254	89.73438434
190805A00049	8/5/2019	1.88	8/4/2023	8/5/2019	100.49095	99.89621105	99.30849797	98.72768273	98.15364444	97.58626499	97.02542901	96.47102379	95.92293919
190805A00050	8/5/2019	1.91	8/5/2024	8/5/2019	101.46961	99.89730261	98.35683252	96.84729715	95.36782928	93.9175939	92.49578668	91.10163254	89.73438434
190806A00026	8/6/2019	1.71	8/7/2023	8/6/2019	100.5096	99.9052469	99.30814582	98.71816999	98.13519231	97.55908869	96.98973798	96.42702183	95.87082468
190806A00027	8/6/2019	1.71	8/7/2023	8/6/2019	100.5096	99.9052469	99.30814582	98.71816999	98.13519231	97.55908869	96.98973798	96.42702183	95.87082468
190807A00005	8/7/2019	1.77	8/7/2024	8/7/2019	101.25245	99.67673146	98.13298521	96.62030813	95.13782671	93.68469998	92.26011797	90.86330027	89.4934947
190807A00012	8/7/2019	1.76	2/7/2023	8/7/2019	100.14801	100.0398855	99.93200604	99.82436994	99.71697631	99.6098243	99.50291308	99.3962418	99.28980963
190807A00014	8/7/2019	1.75	8/7/2023	8/7/2019	100.41407	99.81153808	99.21622083	98.62798907	98.04671682	97.47228105	96.90456161	96.34344117	95.78880513
190807A00020	8/7/2019	1.57	2/7/2024	8/7/2019	100.64239	99.54650444	98.47436277	97.42519729	96.39827581	95.39289699	94.40838867	93.44410643	92.4994321
190807A00021	8/7/2019	2	8/7/2026	8/7/2019	105.35932	101.7922158	98.36506009	95.07159344	91.90587418	88.86225934	85.9353878	83.12016442	80.41174523
190807A00022	8/7/2019	1.76	1/17/2023	8/7/2019	100.07651	100.0265577	99.97667146	99.92685208	99.87709945	99.82741344	99.77779391	99.72824071	99.67875372
190807A00036	8/7/2019	1.75	8/7/2023	8/7/2019	100.41407	99.81153808	99.21622083	98.62798907	98.04671682	97.47228105	96.90456161	96.34344117	95.78880513
190808A00009	8/8/2019	1.89	8/8/2024	8/8/2019	101.45023	99.87024158	98.32234759	96.80563425	95.31922366	93.86227073	92.43396155	91.03351197	89.66016625
190808A00023	8/8/2019	1.68	11/8/2023	8/8/2019	100.59559	99.7415826	98.90202219	98.07654682	97.26480424	96.46645389	95.68116638	94.90862304	94.1485155
190808A00024	8/8/2019	1.69	2/8/2024	8/8/2019	100.77851	99.67917647	98.60370812	97.55133741	96.5213266	95.51296909	94.52558777	93.55853349	92.61118365
190808A00025	8/8/2019	1.7	8/8/2024	8/8/2019	101.46219	99.87664936	98.32340112	96.80152374	95.31013209	93.84837418	92.41542961	91.01050803	89.6328478
190808A00050	8/8/2019	1.7	8/8/2024	8/8/2019	101.46219	99.87664936	98.32340112	96.80152374	95.31013209	93.84837418	92.41542961	91.01050803	89.6328478
190808A00052	8/8/2019	1.7	8/8/2024	8/8/2019	101.46219	99.87664936	98.32340112	96.80152374	95.31013209	93.84837418	92.41542961	91.01050803	89.6328478

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190809A00008	8/9/2019	1.87	8/3/2023	8/9/2019	100.4842	99.89217153	99.30710445	98.728872	98.15735496	97.59243686	97.03400394	96.48194501	95.93615143
190809A00010	8/9/2019	1.88	8/8/2024	8/9/2019	101.43407	99.85422264	98.30646124	96.78987816	95.30359557	93.84676844	92.4185829	91.01825489	89.6450287
190809A00011	8/9/2019	1.69	8/9/2024	8/9/2019	101.45026	99.86219205	98.3065029	96.78226663	95.28859457	93.82463132	92.38955328	90.98256705	89.60290813
190809A00012	8/9/2019	1.69	8/9/2024	8/9/2019	101.45026	99.86219205	98.3065029	96.78226663	95.28859457	93.82463132	92.38955328	90.98256705	89.60290813
190809A00020	8/9/2019	2.44	8/9/2034	8/9/2019	119.35332	107.6973855	97.31265271	88.05275312	79.78890204	72.40770385	65.80924208	59.90541512	54.61848475
190809A00021	8/9/2019	2.12	8/9/2029	8/9/2019	111.30754	104.6481234	98.43273736	92.62945135	87.20879236	82.14354264	77.40855583	72.980589	68.83814918
190809A00022	8/9/2019	1.88	8/9/2024	8/9/2019	101.4383	99.85580123	98.30547863	96.78641811	95.29773824	93.83859054	92.40815793	91.00565327	89.63031793
190812A00003	8/12/2019	1.67	8/12/2024	8/12/2019	101.43043	99.83465042	98.27151028	96.74007222	95.23943668	93.76873804	92.32714296	90.91384887	89.52808251
190812A00006	8/12/2019	1.86	8/12/2024	8/12/2019	101.40242	99.81265485	98.255316	96.72947471	95.23423922	93.76875131	92.33218465	90.92374332	89.54266043
190813A00008	8/13/2019	1.88	8/13/2024	8/13/2019	101.43914	99.84645823	98.28629164	96.75771157	95.2598225	93.79176263	92.35270226	90.94184227	89.55841273
190813A00016	8/13/2019	1.88	8/13/2024	8/13/2019	101.43914	99.84645823	98.28629164	96.75771157	95.2598225	93.79176263	92.35270226	90.94184227	89.55841273
190814A00003	8/14/2019	2.01	8/14/2029	8/14/2019	110.58827	103.9393159	97.7349196	91.94304176	86.53411423	81.48083605	76.75798816	72.34226432	68.21211652
190814A00005	8/14/2019	1.65	8/14/2024	8/14/2019	101.40613	99.8053052	98.23729236	96.70114669	95.19596144	93.72086416	92.27501505	90.8576054	89.46785616
190814A00006	8/14/2019	1.84	8/14/2023	8/14/2019	100.47352	99.85198012	99.23812116	98.63179695	98.03286928	97.44120329	96.8566674	96.27913318	95.70847527
190814A00008	8/14/2019	1.84	8/14/2024	8/14/2019	101.37808	99.78329601	98.22111135	96.69058805	95.19082722	93.72096383	92.28016518	90.86762928	89.48258349
190814A00009	8/14/2019	1.84	8/14/2024	8/14/2019	101.37808	99.78329601	98.22111135	96.69058805	95.19082722	93.72096383	92.28016518	90.86762928	89.48258349
190814A00010	8/14/2019	1.84	4/5/2023	8/14/2019	100.25939	99.99434393	99.73070195	99.46845361	99.20758785	98.94809375	98.68996046	98.43317728	98.1777336
190814A00015	8/14/2019	1.84	8/14/2024	8/14/2019	101.37808	99.78329601	98.22111135	96.69058805	95.19082722	93.72096383	92.28016518	90.86762928	89.48258349
190815A00007	8/15/2019	1.81	7/6/2023	8/15/2019	100.42295	99.90667157	99.39569181	98.88992818	98.3893011	97.89373257	97.40314621	96.91746712	96.43662194
190816A00006	8/16/2019	1.77	8/16/2024	8/16/2019	101.2878	99.68828129	98.12153463	96.58661356	95.08261191	93.60865778	92.16391195	90.74756627	89.35884225
190816A00007	8/16/2019	1.77	8/16/2023	8/16/2019	100.43669	99.8098404	99.19080034	98.57942487	97.9755722	97.37910399	96.78988529	96.20778443	95.6326729
190816A00011	8/16/2019	1.77	8/16/2024	8/16/2019	101.2878	99.68828129	98.12153463	96.58661356	95.08261191	93.60865778	92.16391195	90.74756627	89.35884225
190816A00020	8/16/2019	1.79	8/16/2024	8/16/2019	101.32054	99.72074925	98.15373039	96.61854193	95.11427755	93.64006524	92.19506564	90.7784705	89.38950121
190816A00021	8/16/2019	1.77	8/16/2023	8/16/2019	100.43669	99.8098404	99.19080034	98.57942487	97.9755722	97.37910399	96.78988529	96.20778443	95.6326729
190816A00022	8/16/2019	1.77	8/16/2024	8/16/2019	101.2878	99.68828129	98.12153463	96.58661356	95.08261191	93.60865778	92.16391195	90.74756627	89.35884225
190816A00031	8/16/2019	1.77	8/16/2024	8/16/2019	101.2878	99.68828129	98.12153463	96.58661356	95.08261191	93.60865778	92.16391195	90.74756627	89.35884225
190816A00033	8/16/2019	1.77	8/16/2024	8/16/2019	101.2878	99.68828129	98.12153463	96.58661356	95.08261191	93.60865778	92.16391195	90.74756627	89.35884225
190816A00035	8/16/2019	1.77	8/16/2023	8/16/2019	100.43669	99.8098404	99.19080034	98.57942487	97.9755722	97.37910399	96.78988529	96.20778443	95.6326729
190816A00036	8/16/2019	1.77	8/16/2024	8/16/2019	101.2878	99.68828129	98.12153463	96.58661356	95.08261191	93.60865778	92.16391195	90.74756627	89.35884225
190819A00004	8/20/2019	1.81	5/24/2024	8/20/2019	101.04353	99.66782863	98.31735001	96.99146079	95.68954838	94.41102005	93.15530219	91.92183948	90.71009422
190819A00005	8/19/2019	1.62	8/21/2023	8/19/2019	100.4629	99.82100518	99.1873008	98.56162591	97.94382851	97.33376043	96.73127717	96.13623785	95.54850504
190819A00026	8/19/2019	1.62	8/19/2024	8/19/2019	101.37738	99.76368417	98.18323305	96.63506871	95.11826611	93.63193551	92.17522073	90.74729758	89.34737231
190819A00030	8/19/2019	2.01	8/20/2029	8/19/2019	110.59965	103.9348853	97.71666493	91.91273851	86.49335113	81.43103411	76.70041779	72.27806055	68.14229276

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190820A00005	8/21/2019	1.76	2/27/2023	8/21/2019	100.18019	100.0169356	99.85421368	99.69201897	99.53034895	99.36920108	99.20857289	99.0484619	98.88886564
190820A00008	8/20/2019	1.76	8/20/2024	8/20/2019	101.27078	99.66125247	98.0848333	96.54056463	95.02752614	93.5448325	92.0916318	90.66710386	89.2704588
190820A00013	8/20/2019	1.76	8/21/2023	8/20/2019	100.43269	99.79244163	99.16033617	98.53622001	97.91994233	97.31135608	96.71031791	96.11668797	95.53032987
190820A00019	8/20/2019	1.76	8/21/2023	8/20/2019	100.43269	99.79244163	99.16033617	98.53622001	97.91994232	97.31135608	96.71031791	96.11668797	95.53032987
190820A00020	8/20/2019	1.76	8/20/2024	8/20/2019	101.27078	99.66125247	98.0848333	96.54056463	95.02752614	93.5448325	92.0916318	90.66710386	89.2704588
190820A00021	8/20/2019	2.13	8/20/2029	8/20/2019	109.89071	103.3082322	97.16523549	91.43007411	86.07354447	81.06868053	76.39057098	72.0161925	67.92425722
190820A00029	8/20/2019	1.76	8/20/2024	8/20/2019	101.27078	99.66125247	98.0848333	96.54056463	95.02752614	93.5448325	92.0916318	90.66710386	89.2704588
190820A00038	8/20/2019	1.76	8/20/2024	8/20/2019	101.27078	99.66125247	98.0848333	96.54056463	95.02752614	93.5448325	92.0916318	90.66710386	89.2704588
190821A00017	8/21/2019	1.8	8/21/2024	8/21/2019	101.34068	99.72795219	98.14842821	96.60114966	95.08519225	93.59966693	92.14371822	90.7165226	89.317287
190821A00028	8/21/2019	1.8	8/21/2023	8/21/2019	100.4586	99.81825694	99.18605801	98.56184922	97.94547972	97.33680249	96.73567413	96.1419548	95.55550808
190821A00030	8/21/2019	1.8	8/21/2024	8/21/2019	101.34068	99.72795219	98.14842821	96.60114966	95.08519225	93.59966693	92.14371822	90.7165226	89.317287
190823A00005	8/23/2019	1.62	8/23/2024	8/23/2019	101.39362	99.7692865	98.17856304	96.62047013	95.09406782	93.59845227	92.13275397	90.69613609	89.2877929
190826A00018	8/26/2019	1.9	8/27/2029	8/26/2019	109.87883	103.2196279	97.008137	91.21193502	85.80110989	80.74805404	76.02727521	71.61522372	67.49013478
190826A00029	8/26/2019	1.53	8/26/2024	8/26/2019	101.25572	99.62471146	98.02755572	96.46326713	94.93089513	93.42952582	91.95828021	90.51631248	89.10280839
190826A00030	8/26/2019	1.72	8/26/2026	8/26/2019	105.22161	101.586782	98.09668482	94.74474972	91.52474682	88.43076452	85.45719119	82.59869803	79.85022299
190826A00056	8/26/2019	1.72	8/26/2024	8/26/2019	101.24384	99.61861322	98.0270374	96.46812733	94.94094026	93.44456972	91.97814373	90.54082314	89.13180008
190826A00057	8/26/2019	1.87	8/26/2025	8/26/2019	103.15497	100.5410973	98.00643996	95.54810295	93.16331835	90.84943817	88.60392824	86.42436243	84.30841723
190826A00058	8/26/2019	1.91	8/26/2026	8/26/2019	105.13752	101.5248101	98.05548611	94.72305564	91.52136353	88.4445683	85.48712401	82.64376347	79.90948246
190826A00060	8/26/2019	2.02	8/26/2027	8/26/2019	107.4936	102.8649267	98.46243182	94.27386232	90.28769262	86.49308119	82.87982595	79.43832293	76.15952786
190826A00063	8/26/2019	2.05	8/28/2028	8/26/2019	108.84828	103.2192977	97.91678558	92.92010038	88.21000918	83.76858845	79.579128	75.62604237	71.89478925
190826A00065	8/26/2019	2.09	8/28/2029	8/26/2019	109.63865	103.0442139	96.89143315	91.14842126	85.78575238	80.77626156	76.09485963	71.71836416	67.62534503
190827A00001	8/27/2019	1.74	8/27/2024	8/27/2019	101.26454	99.63682081	98.04282642	96.48157626	94.95212418	93.45356048	91.98501011	90.54563106	89.13461271
190827A00002	8/27/2019	1.74	8/27/2024	8/27/2019	101.26454	99.63682081	98.04282642	96.48157626	94.95212418	93.45356048	91.98501011	90.54563106	89.13461271
190828A00009	8/28/2019	1.71	8/28/2024	8/28/2019	101.21826	99.58833432	97.99221481	96.42891803	94.89749428	93.39703056	91.92664866	90.48550359	89.07278191
190828A00015	8/28/2019	2.04	8/28/2029	8/28/2019	109.30729	102.7236337	96.58112184	90.84789463	85.49455362	80.49395956	75.82104736	71.45265712	67.36737986
190828A00019	8/28/2019	2	3/28/2028	8/28/2019	108.22928	103.0153897	98.08417589	93.41880175	89.00352575	84.82362443	80.86532075	77.11571785	73.56273783
190828A00020	8/28/2019	1.95	5/28/2027	8/28/2019	106.78581	102.408716	98.23600716	94.25710147	90.46202247	86.8413573	83.38622203	80.08822921	76.93945768
190828A00031	8/28/2019	1.71	8/28/2024	8/28/2019	101.21826	99.58833432	97.99221481	96.42891803	94.89749428	93.39703056	91.92664866	90.48550359	89.07278191
190829A00005	8/30/2019	2.06	8/30/2023	8/30/2019	100.63868	99.97353422	99.31714931	98.66935355	98.02997937	97.3988635	96.77584686	96.16077445	95.55349518
190829A00029	8/29/2019	1.75	7/14/2023	8/29/2019	100.39805	99.86023506	99.32817411	98.80177556	98.28094929	97.76560707	97.25566252	96.75103108	96.25162993
190829A00031	8/29/2019	1.54	8/29/2024	8/29/2019	101.28392	99.64479839	98.03981265	96.46795669	94.92826857	93.41982366	91.94173279	90.49314048	89.07322339
190829A00045	8/29/2019	1.9	8/28/2026	8/29/2019	105.1117	101.4942488	98.02054299	94.68406879	91.47864837	88.39841915	85.43781558	82.59155223	79.85460787
190829A00050	8/29/2019	1.73	8/29/2024	8/29/2019	101.25545	99.62259647	98.02364621	96.45760984	94.92353381	93.42050141	91.94763101	90.50407429	89.0890147

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190830A00002	8/30/2019	1.93	8/28/2026	8/30/2019	105.22153	101.6020747	98.12642014	94.78805338	91.58079454	88.49877904	85.53643945	82.68848851	79.94990325
190830A00010	9/3/2019	1.75	9/1/2023	9/3/2019	100.43151	99.76178862	99.10096555	98.44886565	97.80531718	97.17015287	96.54320977	95.92432916	95.31335634
190830A00012	8/30/2019	1.76	8/30/2024	8/30/2019	101.3095	99.6735753	98.07165048	96.50273341	94.9658666	93.46012959	91.9846372	90.53853776	89.12101155
190830A00021	8/30/2019	1.76	8/30/2024	8/30/2019	101.3095	99.6735753	98.07165048	96.50273341	94.9658666	93.46012959	91.9846372	90.53853776	89.12101155
190904A00001	9/4/2019	1.5	9/4/2024	9/4/2019	101.23975	99.5853091	97.96555658	96.37946739	94.82605601	93.30437548	91.81351554	90.35260079	88.92078898
190904A00019	9/4/2019	1.69	9/4/2024	9/4/2019	101.22775	99.57922229	97.96516626	96.38456623	94.8364448	93.31986272	91.83391704	90.37773927	88.95049376
190904A00020	9/4/2019	1.69	9/1/2023	9/4/2019	100.39083	99.72125884	99.06058817	98.40863925	97.76524035	97.13022422	96.50342794	95.88469279	95.27386412
190906A00005	9/6/2019	1.77	9/6/2023	9/6/2019	100.44866	99.76549167	99.09159156	98.42677039	97.77084558	97.12363943	96.48497893	95.85469563	95.2326255
190906A00012	9/6/2019	1.76	9/6/2024	9/6/2019	101.33728	99.68288067	98.06314784	96.47705855	94.92362735	93.40190739	91.9109885	90.44999539	89.01808597
190909A00025	9/9/2019	1.88	9/9/2024	9/9/2019	101.55351	99.88939896	98.26027652	96.66510347	95.10288139	93.57265119	92.07349112	90.60451489	89.16487001
190910A00004	9/11/2019	1.86	9/11/2024	9/11/2019	101.54479	99.87525149	98.24089982	96.64068911	95.0736125	93.53870293	92.03503109	90.56170359	89.11786116
190910A00017	9/16/2019	1.86	9/16/2024	9/16/2019	101.54915	99.86683868	98.22018765	96.608126	95.029627	93.48370479	91.9694123	90.48583936	89.0321108
190910A00030	9/10/2019	1.86	9/10/2024	9/10/2019	101.5237	99.8572431	98.22586747	96.62852777	95.0642217	93.53198648	92.03089686	90.56006329	89.11863014
190913A00014	9/13/2019	2.08	9/13/2024	9/13/2019	101.93036	100.2521982	98.60948141	97.00114852	95.42618291	93.88360828	92.37248659	90.89191611	89.44102972
190917A00028	9/17/2019	2.02	3/1/2023	9/17/2019	100.22778	100.0589637	99.89071609	99.72303194	99.55590846	99.38934287	99.22333241	99.05787433	98.89296591
190917A00035	9/19/2019	2.02	10/16/2023	9/19/2019	100.68456	99.89359405	99.11502034	98.34855398	97.59391406	96.85082835	96.11903289	95.39827172	94.68829659
190919A00007	9/19/2019	2.04	9/19/2024	9/19/2019	101.89037	100.1969071	98.53945787	96.91693895	95.32830938	93.77256991	92.24876077	90.75595976	89.29328031
190919A00025	9/19/2019	1.8	9/19/2024	9/19/2019	101.81713	100.118293	98.45568623	96.82821438	95.23482817	93.67452047	92.14632409	90.64930973	89.18258412
190923A00012	9/23/2019	2.43	9/25/2034	9/23/2019	119.28779	107.5225992	97.05284469	87.7279768	79.41569973	71.99967126	65.37750439	59.4590285	54.16477488
190923A00017	9/23/2019	1.74	9/23/2024	9/23/2019	101.73107	100.0225257	98.35058425	96.71413749	95.11211998	93.54350924	92.0073236	90.5026201	89.02849253
190923A00020	9/23/2019	2.05	9/24/2029	9/23/2019	110.93673	104.1712113	97.86437811	91.982712	86.4953181	81.37370446	76.59158268	72.12468612	67.95060408
190923A00078	9/23/2019	1.96	6/28/2024	9/23/2019	101.37662	99.90724212	98.46649932	97.05362629	95.66788683	94.30857012	92.97498969	91.66648232	90.38240707
190923A00081	9/23/2019	1.96	9/20/2024	9/23/2019	101.7565	100.0616232	98.40283541	96.7790493	95.18922044	93.63234625	92.10746386	90.61364808	89.1500096
190924A00035	9/24/2019	1.88	9/13/2024	9/24/2019	101.58761	99.91247414	98.27273065	96.66731775	95.09522032	93.55546348	92.04711051	90.56926102	89.12104911
190925A00004	9/25/2019	1.7	9/24/2024	9/25/2019	101.66568	99.95510125	98.28121607	96.6429088	95.03911011	93.46879387	91.93097496	90.42470714	88.94908115
190925A00011	9/25/2019	1.89	9/25/2024	9/25/2019	101.63972	99.93316136	98.26315188	96.62857879	95.02837799	93.46152831	91.92704934	90.42399933	88.95147329
190925A00019	9/27/2019	1.93	9/27/2023	9/27/2019	100.58371	99.84388028	99.11489713	98.3965245	97.6885321	96.99069624	96.30279965	95.6246312	94.95598569
190926A00015	9/26/2019	2.32	11/26/2030	9/26/2019	112.52791	104.6772627	97.43701224	90.75645757	84.58935045	78.89348565	73.63032877	68.76468019	64.26437113
190926A00016	9/26/2019	2.28	5/24/2030	9/26/2019	111.62285	104.2740026	97.46445575	91.15180921	85.29720192	79.86499784	74.82250327	70.1397104	65.78906425
190926A00017	9/26/2019	2.23	9/26/2029	9/26/2019	110.6222	103.9227592	97.67597751	91.84886196	86.41099697	81.33432727	76.59296232	72.16299818	68.02235493
190927A00012	10/1/2019	1.96	10/1/2024	10/1/2019	101.80683	100.0827333	98.3958223	96.74496324	95.12906976	93.54709945	91.99805154	90.48096486	88.99491581
190927A00036	9/27/2019	1.94	9/6/2024	9/27/2019	101.64229	99.985223	98.36287271	96.77421265	95.21825611	93.69405501	92.200698	90.73730865	89.30304374
190930A00008	9/30/2019	1.9	10/10/2023	9/30/2019	100.57169	99.79731178	99.03482868	98.2839649	97.54445628	96.81604664	96.09848745	95.39153756	94.6949629

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190930A00012	9/30/2019	1.93	9/30/2024	9/30/2019	101.74912	100.0282466	98.34444249	96.69657048	95.08354476	93.50432361	91.95790722	90.44333549	88.95968605
190930A00035	9/30/2019	1.93	9/30/2024	9/30/2019	101.74912	100.0282466	98.34444249	96.69657048	95.08354476	93.50432361	91.95790722	90.44333549	88.95968605
190930A00069	9/30/2019	1.9	9/29/2023	9/30/2019	100.56338	99.81829441	99.08420902	98.36088157	97.64807704	96.94556723	96.25313049	95.57055148	94.89762097
190930A00070	9/30/2019	1.93	9/27/2024	9/30/2019	101.73574	100.0228025	98.34663738	96.70612145	95.10018146	93.5277876	91.98795124	90.4797229	89.00219023
190930A00071	9/30/2019	2.05	9/29/2025	9/30/2019	103.80627	101.0950306	98.46813552	95.92240941	93.45482282	91.06248227	88.74262299	86.49260213	84.30989236
190930A00075	9/30/2019	2.19	9/29/2027	9/30/2019	108.50134	103.7591058	99.2522147	94.96770323	90.89339681	87.01785653	83.33033014	79.82070679	76.47947488
190930A00077	9/30/2019	2.23	9/28/2029	9/30/2019	110.62605	103.9214624	97.67019424	91.83918414	86.39795295	81.31838835	76.57454872	72.14248431	68.0000741
191001A00023	10/1/2019	1.85	9/27/2024	10/1/2019	101.59558	99.88390561	98.20898117	96.56968353	94.96494004	93.39372145	91.85503973	90.34794595	88.87152828
191002A00006	10/2/2019	1.84	10/2/2024	10/2/2019	101.59986	99.87493642	98.18727729	96.53574733	94.91926082	93.33677573	91.78729146	90.26984679	88.78351787
191002A00016	10/2/2019	1.79	10/2/2023	10/2/2019	100.48347	99.73070671	98.98918365	98.25864628	97.53885199	96.82956525	96.1305574	95.44160632	94.76249629
191002A00017	10/2/2019	1.84	10/2/2024	10/2/2019	101.59986	99.87493642	98.18727729	96.53574733	94.91926082	93.33677573	91.78729146	90.26984679	88.78351787
191003A00014	10/3/2019	1.71	9/20/2024	10/3/2019	101.32328	99.63226926	97.97727842	96.35722094	94.77105428	93.21777766	91.69642994	90.20608762	88.745863
191003A00019	10/3/2019	1.71	9/27/2024	10/3/2019	101.35029	99.64083599	97.9680828	96.33091718	94.72826754	93.15910569	91.6224446	90.11733629	88.64286987
191003A00022	10/3/2019	1.72	2/3/2023	10/3/2019	100.1357	100.0386384	99.94177186	99.84509876	99.74861848	99.65233043	99.55623401	99.46032866	99.36461378
191004A00001	10/4/2019	2.47	10/4/2034	10/4/2019	117.08661	105.5825152	95.34324904	86.22197608	78.08964065	70.83273446	64.35135139	58.55749443	53.37360091
191004A00002	10/4/2019	2.08	10/4/2029	10/4/2019	109.63018	102.9430456	96.70969424	90.89694715	85.47422356	80.41332086	75.6882175	71.27489326	67.15116519
191004A00003	10/4/2019	1.89	10/5/2026	10/4/2019	105.27772	101.5578766	97.98931394	94.56503528	91.27840836	88.12314609	85.09328623	82.18317252	79.38743692
191004A00004	10/4/2019	1.54	10/4/2024	10/4/2019	101.42707	99.69210114	97.99481775	96.33408381	94.70880467	93.11792938	91.56044848	90.03539188	88.54182694
191004A00005	10/4/2019	1.54	10/4/2024	10/4/2019	101.42707	99.69210114	97.99481775	96.33408381	94.70880467	93.11792938	91.56044848	90.03539188	88.54182694
191004A00012	10/4/2019	1.78	10/4/2024	10/4/2019	101.50275	99.77331086	98.08133988	96.42570389	94.80531703	93.21913665	91.66616116	90.14542794	88.65601144
191004A00032	10/4/2019	2.01	1/3/2028	10/4/2019	107.99196	103.0092009	98.28652098	93.80900244	89.56265864	85.53437199	81.71183544	78.08349823	74.63851562
191007A00029	10/7/2019	1.88	10/9/2029	10/7/2019	109.81646	103.0490184	96.74365408	90.86642924	85.386067	80.2737313	75.50282413	71.04880063	66.88900048
191008A00031	10/8/2019	1.52	10/8/2024	10/8/2019	101.40866	99.66300425	97.95548548	96.28496087	94.65033446	93.05055314	91.48460445	89.95151463	88.45034675
191008A00033	10/8/2019	1.71	10/8/2024	10/8/2019	101.39567	99.65641597	97.95505732	96.29046072	94.66153949	93.06724928	91.50658597	89.97858371	88.48231309
191009A00017	10/9/2019	1.76	10/4/2024	10/9/2019	101.46733	99.73821094	98.04655674	96.39123178	94.77115036	93.18526999	91.6325892	90.11214554	88.62301359
191009A00027	10/9/2019	1.74	10/6/2023	10/9/2019	100.4495	99.68621624	98.93449148	98.19406617	97.46468701	96.74610821	96.03809125	95.34040459	94.65282338
191009A00028	10/9/2019	1.76	10/9/2024	10/9/2019	101.48913	99.74632536	98.04153925	96.37364194	94.74154601	93.1442061	91.58061694	90.04981136	88.55085848
191015A00013	10/15/2019	1.72	10/15/2024	10/15/2019	101.79944	100.0311791	98.30191231	96.61049335	94.9558217	93.3368381	91.75252263	90.20189292	88.6840024
191015A00029	10/15/2019	1.91	10/15/2024	10/15/2019	101.78548	100.0237417	98.30075025	96.6153683	94.96650473	93.35310922	91.77417037	90.22871389	88.71580092
191017A00022	10/17/2019	2.25	7/17/2028	10/17/2019	109.87039	104.3226936	99.09085059	94.15522625	89.49751009	85.10061622	80.94859522	77.02655275	73.32057447
191017A00026	10/17/2019	2.3	7/17/2029	10/17/2019	110.94006	104.4109625	98.31196269	92.61247678	87.28424393	82.30114233	77.63901674	73.27552089	69.18997319
191021A00021	10/21/2019	2.22	12/21/2027	10/21/2019	108.98568	104.0128659	99.29757032	94.82513169	90.58179368	86.55464852	82.73158038	79.1012128	75.65285981
191023A00006	10/23/2019	1.95	10/23/2024	10/23/2019	101.89657	100.1121932	98.36748762	96.66131366	94.99257587	93.36021791	91.76322075	90.20060112	88.67140996

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191025A00005	10/28/2019	1.98	10/28/2024	10/28/2019	101.97607	100.1774476	98.41907824	96.69982295	95.01858327	93.37429861	91.7659448	90.19253251	88.65310591
191025A00009	10/25/2019	2.26	5/25/2029	10/25/2019	110.58219	104.2000547	98.23014695	92.64372321	87.41418251	82.51689719	77.92905718	73.62952727	69.59871634
191025A00010	10/25/2019	2.24	7/25/2028	10/25/2019	109.83816	104.2699537	99.01982058	94.06793259	89.39579539	84.98615571	80.82291159	76.89102973	73.17646909
191025A00013	10/25/2019	1.98	10/25/2024	10/25/2019	101.96118	100.170802	98.42032859	96.70862496	95.03459431	93.39717847	91.79535627	90.22814189	88.69458347
191031A00033	10/31/2019	2.2	5/31/2028	10/31/2019	109.47216	104.0577858	98.94542744	94.11670133	89.55442983	85.24255989	81.16608392	77.31096659	73.6640772
191031A00041	10/31/2019	1.72	10/31/2023	10/31/2019	100.61629	99.78353281	98.96450468	98.15886736	97.36629471	96.58647107	95.81909088	95.06385831	94.32048678
191104A00009	11/4/2019	1.91	11/6/2023	11/4/2019	100.62156	99.77506775	98.94276829	98.12431071	97.31935188	96.52755992	95.74861373	94.9822026	94.22802579
191104A00018	11/5/2019	1.96	11/5/2024	11/5/2019	101.97672	100.1570656	98.37856601	96.6400544	94.94040405	93.27852707	91.65337272	90.06392592	88.50920584
191104A00022	11/4/2019	2.17	8/4/2027	11/4/2019	108.12578	103.5387387	99.17332462	95.01765642	91.06055439	87.29149469	83.70056717	80.27843623	77.01630433
191104A00023	11/4/2019	2.24	8/4/2028	11/4/2019	109.86451	104.2692664	98.99494415	94.02145254	89.33006377	84.9033119	80.72490128	76.77962209	73.05327244
191104A00024	11/4/2019	2.26	8/3/2029	11/4/2019	110.71593	104.1498003	98.01895467	92.29225466	86.94094302	81.93845205	77.26022604	72.88355892	68.78744592
191104A00025	11/4/2019	2.33	8/2/2030	11/4/2019	112.21878	104.6709354	97.68927398	91.22829834	85.24639171	79.70546837	74.57065698	69.81001392	65.3942635
191105A00007	11/5/2019	1.98	11/5/2026	11/5/2019	106.62016	102.7691852	99.07833343	95.54013845	92.14752184	88.89376918	85.77250938	82.77769546	79.90358634
191105A00008	11/5/2019	1.83	11/5/2024	11/5/2019	102.10342	100.2758447	98.48971304	96.74384507	95.03710349	93.36839031	91.73664519	90.14084391	88.57999688
191105A00014	11/5/2019	1.96	11/6/2023	11/5/2019	100.66454	99.81784738	98.98534925	98.16669534	97.36154246	96.56955867	95.79042285	95.02382424	94.26946205
191105A00018	11/5/2019	1.78	11/6/2023	11/5/2019	100.67837	99.82930597	98.99451623	98.17364147	97.36633595	96.57226529	95.79110604	95.02254521	94.26627984
191106A00012	11/6/2019	2.02	10/11/2024	11/6/2019	101.96332	100.2107529	98.49651006	96.81945746	95.17850475	93.57260335	92.0007444	90.46195689	88.95530586
191106A00022	11/6/2019	2.34	1/2/2030	11/6/2019	111.61231	104.629138	98.13440304	92.09136867	86.46623758	81.22790654	76.34773873	71.7993564	67.55845193
191107A00011	11/8/2019	2.02	2/24/2023	11/8/2019	100.21589	100.0608488	99.9062919	99.75221595	99.59861875	99.44549809	99.29285175	99.14067756	98.98897333
191108A00011	11/8/2019	2.08	10/18/2024	11/8/2019	102.10738	100.3345544	98.60086247	96.90517168	95.24638805	93.62345783	92.03536566	90.4811328	88.95981553
191108A00013	11/8/2019	2.25	11/8/2029	11/8/2019	112.41555	105.4827453	99.02687463	93.01266586	87.40762747	82.18181343	77.30761196	72.75955268	68.51413069
191108A00014	11/8/2019	2.25	11/8/2029	11/8/2019	112.41555	105.4827453	99.02687463	93.01266586	87.40762747	82.18181343	77.30761196	72.75955268	68.51413069
191113A00016	11/15/2019	2.02	8/15/2024	11/15/2019	101.6925	100.092175	98.5245914	96.98880859	95.48392243	94.00906293	92.56339261	91.14610499	89.75642312
191114A00008	11/18/2019	1.93	4/17/2023	11/18/2019	100.31224	100.0142067	99.71794815	99.42345308	99.13070574	98.83969053	98.55039206	98.26279508	97.97688457
191114A00009	11/18/2019	1.94	8/16/2023	11/18/2019	100.54446	99.91722757	99.2978056	98.6860516	98.08182371	97.48498356	96.89539615	96.31292975	95.73745582
191115A00014	11/18/2019	2.45	11/18/2024	11/18/2019	102.9457	101.0831537	99.26340155	97.48520932	95.74738644	94.0487841	92.38829347	90.76484405	89.17740209
191115A00015	11/18/2019	2.61	11/18/2024	11/18/2019	103.24872	101.3832293	99.5605912	97.77956695	96.03896455	94.33763372	92.67446427	91.04838435	89.45835893
191115A00016	11/18/2019	2.48	11/18/2024	11/18/2019	103.00252	101.1394179	99.31912461	97.54040138	95.80205734	94.1029434	92.44195049	90.81800786	89.2300815
191115A00028	11/15/2019	2.34	9/28/2029	11/15/2019	111.36411	104.6352121	98.3608045	92.50775809	87.0455305	81.94595031	77.18302059	72.73273983	68.57293855
191115A00030	11/15/2019	2.35	11/9/2029	11/15/2019	111.53798	104.6949199	98.32120229	92.38220599	86.84603184	81.68327366	76.86681183	72.37162493	68.17461772
191119A00027	11/19/2019	1.8	11/19/2024	11/19/2019	102.11342	100.2490896	98.42780996	96.64832977	94.90944689	93.21000144	91.54887412	89.92498449	88.33728936
191120A00005	11/20/2019	2.63	11/20/2034	11/20/2019	118.95626	107.237387	96.81619717	87.54086224	79.27807556	71.91070849	65.33577359	59.46265298	54.21155636
191120A00006	11/20/2019	2.67	11/20/2035	11/20/2019	119.68199	107.0751845	95.96534047	86.16491004	77.51079477	69.86104446	63.09201877	57.09594197	51.77879471

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191120A00011	11/20/2019	1.88	1/20/2023	11/20/2019	100.09626	100.0379803	99.979782	99.92166659	99.86363385	99.80568362	99.74781572	99.69002997	99.6323262
191120A00024	11/20/2019	2.23	11/16/2029	11/20/2019	110.73425	103.9005832	97.53733047	91.60968665	86.0855889	80.93548734	76.13213639	71.65040434	67.46709967
191121A00004	11/21/2019	1.77	11/21/2024	11/21/2019	102.06565	100.196553	98.37072901	96.58691703	94.84390563	93.14052623	91.47565118	89.84819212	88.25709828
191121A00009	11/21/2019	2.55	11/21/2036	11/21/2019	121.28916	107.5449326	95.55134664	85.07377163	75.91021284	67.88662489	60.85291789	54.67955132	49.25462674
191121A00010	11/21/2019	2.59	11/20/2037	11/21/2019	121.97235	107.3603984	94.72326684	83.78030835	74.29220782	66.05470633	58.89330661	52.65880058	47.22348796
191121A00034	11/21/2019	2.28	11/2/2029	11/21/2019	111.04478	104.2357937	97.89295363	91.98195141	86.47116669	81.3314447	76.53589258	72.05969345	67.87993668
191122A00018	11/26/2019	3.11	11/22/2039	11/26/2019	125.99061	109.7913658	95.99862436	84.23489992	74.18405259	65.58103	58.20336832	51.86414386	46.40612158
191122A00020	11/26/2019	3.2	11/23/2037	11/26/2019	127.30975	112.558378	99.77262339	88.67548752	79.03052147	70.63570224	63.31825787	56.93029297	51.3450874
191122A00021	11/26/2019	3.4	11/22/2038	11/26/2019	130.52264	114.7441761	101.1787238	89.4976045	79.42282729	70.71903108	63.18674173	56.65672522	50.98525417
191125A00036	11/25/2019	2.29	11/23/2029	11/25/2019	111.16055	104.2950374	97.90303617	91.94943603	86.40189898	81.23062732	76.40815226	71.90914102	67.71022086
191126A00022	11/26/2019	1.72	5/26/2023	11/26/2019	100.40028	99.99452057	99.59204121	99.19279978	98.79675728	98.40387536	98.01411625	97.62744279	97.2438184
191126A00023	11/26/2019	1.81	5/27/2025	11/26/2019	103.09347	100.7096348	98.39280662	96.14073052	93.95124325	91.82226671	89.75180396	87.73793561	85.77881629
191126A00026	11/26/2019	1.91	11/25/2026	11/26/2019	106.46664	102.5659168	98.82951193	95.2496631	91.81901799	88.53060732	85.37782291	82.35439703	79.45438315
191129A00012	11/29/2019	1.99	11/29/2024	11/29/2019	102.12567	100.2424822	98.40319899	96.60654057	94.85126881	93.13618959	91.46015098	89.82204143	88.2207881
191202A00005	12/2/2019	2.03	12/2/2024	12/2/2019	102.2174	100.3253345	98.47756166	96.67277795	94.90972953	93.18720739	91.50404544	89.85911861	88.25134121
191203A00004	12/4/2019	1.87	12/4/2024	12/4/2019	101.9174	100.022946	98.17297452	96.36617418	94.60128225	92.87708124	91.192397	89.54609684	87.93708779
191204A00013	12/4/2019	1.72	12/4/2024	12/4/2019	102.02972	100.1266599	98.26841146	96.45364656	94.68109005	92.94951263	91.25772889	89.60459541	87.989009
191206A00008	12/6/2019	2.44	12/6/2030	12/6/2019	113.50384	105.5905164	98.29359519	91.56174225	85.34815101	79.61011798	74.30866406	69.40819245	64.87617959
191206A00009	12/6/2019	2.87	12/4/2037	12/6/2019	122.6459	108.1951988	95.68539582	84.84155778	75.42916258	67.24797005	60.12685178	53.91942284	48.50034775
191206A00013	12/6/2019	3.05	12/6/2044	12/6/2019	127.09764	107.3783881	91.28222614	78.10422906	67.28123263	58.36261305	50.98721894	44.86513293	39.76323237
191206A00019	12/6/2019	1.96	11/15/2023	12/6/2019	100.6814	99.81069743	98.95501111	98.11395556	97.28715786	96.47425763	95.67490658	94.88876797	94.11551615
191206A00021	12/6/2019	2.02	12/6/2024	12/6/2019	102.21798	100.3151862	98.45717531	96.64262868	94.87027149	93.1388748	91.44725348	89.79426445	88.17880479
191206A00044	12/10/2019	2.01	10/31/2024	12/10/2019	102.04599	100.2387003	98.47201764	96.7447969	95.05593361	93.40436098	91.78904844	90.20900014	88.66325356
191212A00028	12/13/2019	1.93	1/17/2023	12/13/2019	100.08501	100.0350488	99.98515519	99.93532853	99.88556863	99.83587535	99.78624857	99.73668813	99.6871939
191212A00029	12/13/2019	1.94	5/16/2023	12/13/2019	100.38908	100.0115242	99.6368117	99.26491134	98.89579148	98.52942096	98.16576905	97.8048055	97.44650049
191217A00012	12/20/2019	2.03	12/20/2024	12/20/2019	102.30747	100.3662472	98.47158168	96.62207572	94.81637925	93.05319181	91.33126024	89.64937672	88.00637675
191218A00014	12/18/2019	2.04	12/18/2024	12/18/2019	102.31722	100.3812575	98.49160251	96.6468676	94.84571348	93.0868499	91.36903343	89.69106548	88.05179036
191219A00036	12/20/2019	2.1	12/20/2024	12/20/2019	102.44616	100.5035278	98.60748449	96.75662707	94.94960479	93.18511644	91.46190822	89.77877164	88.13454155
191220A00001	12/20/2019	2.62	12/19/2031	12/20/2019	116.4847	107.4925745	99.27878224	91.77154735	84.90606473	78.62379124	72.87181149	67.60227082	62.77186794
191220A00002	12/20/2019	3.02	12/20/2038	12/20/2019	124.82167	109.4052282	96.17620766	84.80701429	75.02091991	66.58392865	59.29797652	52.9952425	47.53338495
191223A00055	12/23/2019	2.46	12/7/2029	12/23/2019	112.36718	105.4252964	98.96384274	92.94704289	87.34195948	82.11825461	77.24797228	72.70534027	68.46658928
191223A00056	12/23/2019	2.46	12/14/2029	12/23/2019	112.38885	105.4281117	98.95035997	92.91953081	87.30243255	82.06849999	77.18957405	72.639701	68.39494939
191226A00019	12/26/2019	2.4	12/22/2028	12/26/2019	111.11387	105.1188966	99.48812603	94.19753729	89.22480964	84.54919717	80.15140999	76.01350492	72.11878499

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191226A00020	12/26/2019	2.44	12/21/2029	12/26/2019	112.27187	105.2970156	98.80746675	92.76689364	87.14186213	81.90159086	77.01772818	72.46414879	68.21676843
191230A00012	12/30/2019	1.77	12/1/2023	12/30/2019	100.71699	99.80109526	98.90178334	98.0186102	97.15114466	96.29897076	95.46168711	94.63890626	93.83025409
191230A00013	12/30/2019	1.84	12/2/2024	12/30/2019	102.25255	100.352674	98.49739986	96.68541133	94.91544267	93.18627353	91.49672699	89.84566771	88.23200019
191230A00031	12/30/2019	1.85	12/30/2024	12/30/2019	102.41492	100.43788	98.50902828	96.62688841	94.79004172	92.99712255	91.24681582	89.53785479	87.86901892
200103A00009	1/3/2020	1.9	1/3/2024	1/3/2020	100.72877	99.72782233	98.74668652	97.78478082	96.84154427	95.9164375	95.00894178	94.11855796	93.24480562
200106A00015	1/6/2020	1.87	2/15/2024	1/6/2020	100.77567	99.66115869	98.57120072	97.50498859	96.46175281	95.44075681	94.44129521	93.4626922	92.50429998
200108A00021	1/13/2020	1.97	1/13/2025	1/13/2020	102.30368	100.2990191	98.34364697	96.43603278	94.57470709	92.75825626	90.98531988	89.25458839	87.56480077
200110A00013	1/10/2020	1.76	1/10/2024	1/10/2020	100.79135	99.76875369	98.76682251	97.7849338	96.82249081	95.87892028	94.95367129	94.04621418	93.15603953
200110A00014	1/10/2020	1.73	1/10/2023	1/10/2020	100.04821	100.0176503	99.98713007	99.95664513	99.9261954	99.89578079	99.86540125	99.83505671	99.8047471
200110A00022	1/13/2020	2	1/6/2025	1/13/2020	102.33117	100.3445638	98.40651925	96.51554254	94.67019655	92.86909826	91.11091623	89.39436828	87.71821931
200114A00006	1/15/2020	1.99	1/15/2025	1/15/2020	102.35425	100.3438211	98.38290241	96.4699517	94.60348984	92.78209404	91.00439526	89.26907577	87.57486682
200115A00015	1/17/2020	1.88	1/17/2023	1/17/2020	100.08251	100.0325514	99.98265997	99.93283545	99.88307769	99.83338656	99.7837619	99.73420359	99.68471149
200115A00017	1/15/2020	1.88	1/17/2023	1/15/2020	100.08251	100.0325514	99.98265997	99.93283545	99.88307769	99.83338656	99.7837619	99.73420359	99.68471149
200115A00018	1/15/2020	1.9	1/16/2024	1/15/2020	100.7558	99.72034893	98.70610376	97.71241624	96.73866615	95.78425795	94.84861965	93.93120162	93.03147549
200115A00024	1/15/2020	1.88	1/17/2023	1/15/2020	100.08251	100.0325514	99.98265997	99.93283545	99.88307769	99.83338656	99.7837619	99.73420359	99.68471149
200121A00009	1/24/2020	1.94	1/24/2025	1/24/2020	102.29376	100.260416	98.27751537	96.34347604	94.45677673	92.61595484	90.81960367	89.06636988	87.35495102
200122A00034	1/22/2020	1.87	1/22/2024	1/22/2020	100.73615	99.68497299	98.65564853	97.64749853	96.6598748	95.69215541	94.7437433	93.81406509	92.9025699
200122A00035	1/22/2020	1.94	1/22/2025	1/22/2020	102.2844	100.2563864	98.27860306	96.34947708	94.4674967	92.63120831	90.83921378	89.09016783	87.38277563
200123A00013	1/27/2020	1.89	1/27/2025	1/27/2020	102.20356	100.1633222	98.17383372	96.23349209	94.34076227	92.49416863	90.69229221	88.93376807	87.21728276
200123A00048	1/23/2020	1.7	1/23/2025	1/23/2020	102.22338	100.1850955	98.19748379	96.2589557	94.36798066	92.52308726	90.72286042	88.96593881	87.25101236
200123A00049	1/23/2020	1.63	1/23/2023	1/23/2020	100.09851	100.0318656	99.96532144	99.89887811	99.83253538	99.76629302	99.7001508	99.63410849	99.56816585
200124A00008	1/24/2020	1.92	1/22/2027	1/24/2020	106.85534	102.7913047	98.90450936	95.18627873	91.62841412	88.22316055	84.96318008	81.84152707	78.85162499
200127A00013	1/27/2020	1.56	1/27/2023	1/27/2020	100.10949	100.0317432	99.95412725	99.8766375	99.79927364	99.72203537	99.64492238	99.56793437	99.49107104
200127A00016	1/27/2020	1.81	1/27/2025	1/27/2020	102.03676	99.99829962	98.01054922	96.07191149	94.18085234	92.33589709	90.53562767	88.77867999	87.06374145
200127A00023	1/27/2020	1.8	1/27/2025	1/27/2020	102.01591	99.9776718	97.99013866	96.05171391	94.1608636	92.31611315	90.5160446	88.75929398	87.04454878
200127A00030	1/27/2020	1.8	1/27/2025	1/27/2020	102.01591	99.9776718	97.99013866	96.05171391	94.1608636	92.31611315	90.5160446	88.75929398	87.04454878
200128A00028	1/28/2020	1.81	1/28/2025	1/28/2020	102.04108	99.99996736	98.00966645	96.06858058	94.17517089	92.32795813	90.52551996	88.76648822	87.04954649
200130A00005	1/30/2020	1.73	1/30/2024	1/30/2020	100.59912	99.52764659	98.47887942	97.45210613	96.44664095	95.46182634	94.49703153	93.55165122	92.62510429
200130A00006	1/30/2020	1.77	1/30/2025	1/30/2020	101.96601	99.9204706	97.92594539	95.98082314	94.08355583	92.2326556	90.42669194	88.66428903	86.94412315
200130A00012	1/30/2020	1.72	1/30/2023	1/30/2020	100.12833	100.042321	99.95646219	99.8707494	99.78518224	99.69976035	99.61448336	99.52935093	99.44436269
200130A00016	1/30/2020	1.58	1/30/2025	1/30/2020	102.00384	99.94948277	97.94650807	95.99328782	94.08825899	92.22991948	90.41682529	88.64758774	86.92087092
200130A00021	1/30/2020	1.54	1/30/2023	1/30/2020	100.11949	100.0334285	99.94750985	99.86173802	99.77611265	99.69063337	99.60529982	99.52011163	99.43506844
200130A00025	1/30/2020	1.54	1/30/2023	1/30/2020	100.11949	100.0334285	99.94750985	99.86173802	99.77611265	99.69063337	99.60529982	99.52011163	99.43506844

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200130A00028	1/30/2020	1.54	2/7/2023	1/30/2020	100.13586	100.0276326	99.91964874	99.81190979	99.70441483	99.59716299	99.49015341	99.38338523	99.2768576
200131A00007	1/31/2020	1.68	1/31/2023	1/31/2020	100.12709	100.0383167	99.94970334	99.8612477	99.77294931	99.68480776	99.59682264	99.50899354	99.42132005
200131A00010	2/3/2020	1.68	2/3/2023	2/3/2020	100.13181	100.0347544	99.93789159	99.84122219	99.74474561	99.64846124	99.55236852	99.45646684	99.36075563
200131A00015	2/5/2020	1.73	2/5/2025	2/5/2020	101.9107	99.84904012	97.83909232	95.87921324	93.96782293	92.10340341	90.28449573	88.50969717	86.77765864
200131A00016	1/31/2020	1.73	1/31/2025	1/31/2020	101.88702	99.83953786	97.84317099	95.89630332	93.99738194	92.14491439	90.33746582	88.57365629	86.85215823
200131A00032	1/31/2020	2.1	1/31/2030	1/31/2020	110.00701	103.0058184	96.50006553	90.45210083	84.82732453	79.59392184	74.72262519	70.18649801	65.96073785
200131A00038	1/31/2020	1.73	1/30/2025	1/31/2020	101.88228	99.83763845	97.84398878	95.89972482	94.00329901	92.15322398	90.34806969	88.58646072	86.86707379
200131A00047	1/31/2020	1.68	1/31/2023	1/31/2020	100.12709	100.0383167	99.94970334	99.8612477	99.77294931	99.68480776	99.59682264	99.50899354	99.42132005
200131A00048	1/31/2020	1.69	1/31/2024	1/31/2020	100.55708	99.48321177	98.43216383	97.40321429	96.39567231	95.40887558	94.44218884	93.49500252	92.56673148
200203A00001	2/3/2020	1.7	2/3/2023	2/3/2020	100.13376	100.0366964	99.93983172	99.84316048	99.74668204	99.65039583	99.55430126	99.45839775	99.36268471
200203A00004	2/3/2020	1.7	2/3/2023	2/3/2020	100.13376	100.0366964	99.93983172	99.84316048	99.74668204	99.65039583	99.55430126	99.45839775	99.36268471
200203A00005	2/3/2020	1.7	5/3/2023	2/3/2020	100.27497	99.93318568	99.59372262	99.25656097	98.92167741	98.58904893	98.25865282	97.93046669	97.60446842
200203A00006	2/3/2020	1.76	2/3/2025	2/3/2020	101.96435	99.90768362	97.90250401	95.94717801	94.04013612	92.17987024	90.36493075	88.59392372	86.86550837
200203A00011	2/3/2020	1.7	2/15/2023	2/3/2020	100.15376	100.023578	99.8937436	99.76425901	99.6351228	99.50633354	99.3778898	99.24979018	99.12203327
200204A00001	2/4/2020	1.79	2/4/2025	2/4/2020	102.03237	99.97218911	97.96362668	96.00504511	94.09486912	92.23158512	90.41373831	88.63992988	86.90881439
200204A00012	2/4/2020	1.98	2/4/2027	2/4/2020	106.30058	102.2374293	98.35223643	94.63625183	91.08120953	87.67929316	84.42310888	81.30566008	78.32032377
200204A00016	2/4/2020	1.72	2/6/2023	2/4/2020	100.14145	100.0360937	99.93097292	99.82608271	99.7214223	99.6169909	99.51278775	99.40881207	99.30506309
200204A00020	2/4/2020	1.6	2/4/2025	2/4/2020	102.07079	100.001687	97.98458138	96.01781329	94.09979216	92.22898991	90.40393797	88.62322446	86.88549149
200205A00011	2/7/2020	2.31	2/7/2024	2/7/2020	101.25999	100.1635272	99.09073927	98.04087019	97.0131913	96.00700455	95.02164094	94.05645895	93.11084321
200205A00013	2/5/2020	1.77	2/6/2023	2/5/2020	100.14672	100.0413642	99.93623804	99.83134249	99.72667675	99.62224003	99.51803157	99.41405059	99.31029633
200207A00004	2/7/2020	1.53	2/7/2023	2/7/2020	100.13478	100.0265506	99.91856795	99.81083011	99.70333626	99.59608553	99.48907706	99.38230999	99.27578347
200207A00009	2/7/2020	1.58	2/7/2025	2/7/2020	102.04338	99.96616799	97.94129949	95.96710597	94.04198061	92.16438002	90.33282118	88.54587853	86.80218131
200207A00016	2/7/2020	1.74	2/7/2024	2/7/2020	100.62454	99.53183323	98.46275395	97.41653818	96.39245868	95.38981874	94.40795061	93.44621404	92.50399484
200207A00017	2/7/2020	1.96	2/8/2027	2/7/2020	106.24253	102.169405	98.27509027	94.55077954	90.98814858	87.57932718	84.31687162	81.19373912	78.20326392
200207A00018	2/7/2020	2.14	2/7/2030	2/7/2020	110.30952	103.2791846	96.74734211	90.67603465	85.03038111	79.77831438	74.89034051	70.33931969	66.10026702
200210A00005	2/10/2020	1.77	2/10/2027	2/10/2020	106.35491	102.2488212	98.32380372	94.5709016	90.9816531	87.54805984	84.2625587	81.11799556	78.10760077
200210A00009	2/10/2020	1.57	2/10/2025	2/10/2020	102.03693	99.95137678	97.91852786	95.93669699	94.00426093	92.11966077	90.28139883	88.48803575	86.73818767
200210A00021	2/10/2020	1.76	2/10/2025	2/10/2020	101.99808	99.92155021	97.89735207	95.92380916	93.9993139	92.1223222	90.29135045	88.50497265	86.76181764
200212A00003	2/12/2020	1.63	2/12/2025	2/12/2020	102.17478	100.0821134	98.04243121	96.05402672	94.1152648	92.22457533	90.38045004	88.58143951	86.82615041
200214A00002	2/14/2020	1.58	11/15/2024	2/14/2020	101.6789	99.82926049	98.02212196	96.25626487	94.53050789	92.84371106	91.19477408	89.58263463	88.00626679
200214A00005	2/14/2020	1.59	2/14/2025	2/14/2020	102.09938	100.0019277	97.95768464	95.96493421	94.02203066	92.12739387	90.27950612	88.4769091	86.71820107
200214A00007	2/14/2020	1.59	2/14/2025	2/14/2020	102.09938	100.0019277	97.95768464	95.96493421	94.02203066	92.12739387	90.27950612	88.4769091	86.71820107
200214A00014	2/18/2020	1.8	2/18/2025	2/18/2020	102.12242	100.0222654	97.97542743	95.98018787	94.03489443	92.13796088	90.28786382	88.48313966	86.72238168

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200214A00015	2/18/2020	1.76	8/6/2024	2/18/2020	101.23243	99.65948363	98.11842598	96.60835179	95.12839121	93.67770672	92.25549164	90.86096868	89.49338859
200214A00020	2/18/2020	1.78	1/15/2025	2/18/2020	101.92329	99.91737475	97.96088179	96.05227048	94.19006414	92.37284232	90.59923826	88.86793639	87.17767005
200218A00004	2/18/2020	1.73	2/21/2023	2/18/2020	100.16763	100.020897	99.87459942	99.72873786	99.58331036	99.43831498	99.29374977	99.14961283	99.00590225
200218A00024	2/20/2020	1.73	7/17/2023	2/20/2020	100.38941	99.84352323	99.30356356	98.76943584	98.24104587	97.71830146	97.20111242	96.68939043	96.18304909
200220A00015	2/20/2020	1.57	2/20/2025	2/20/2020	102.08609	99.9719724	97.91178697	95.90378753	93.94629499	92.03769776	90.17644843	88.36106064	86.59010615
200220A00025	2/20/2020	1.72	2/21/2023	2/20/2020	100.16616	100.0194275	99.87313167	99.7272719	99.58184617	99.43685255	99.29228911	99.14815393	99.00444451
200221A00003	2/25/2020	1.69	2/25/2025	2/25/2020	101.91886	99.80146045	97.73818279	95.727269	93.76702921	91.85584171	89.99214966	88.17445786	86.40132981
200221A00004	2/21/2020	1.69	2/21/2025	2/21/2020	101.90036	99.79427897	97.74183751	95.7412928	93.79097733	91.88929054	90.0346955	88.22571584	86.46093284
200221A00013	2/21/2020	1.69	2/21/2025	2/21/2020	101.90036	99.79427897	97.74183751	95.7412928	93.79097733	91.88929054	90.0346955	88.22571584	86.46093284
200221A00014	2/21/2020	1.49	2/21/2023	2/21/2020	100.15716	100.010179	99.8636443	99.71754909	99.57189138	99.42666919	99.28188054	99.13752345	98.99359599
200221A00016	2/21/2020	1.69	2/21/2025	2/21/2020	101.90036	99.79427897	97.74183751	95.7412928	93.79097733	91.88929054	90.0346955	88.22571584	86.46093284
200221A00031	2/21/2020	1.69	2/21/2025	2/21/2020	101.90036	99.79427897	97.74183751	95.7412928	93.79097733	91.88929054	90.0346955	88.22571584	86.46093284
200224A00001	2/24/2020	1.59	2/24/2025	2/24/2020	101.6981	99.58590607	97.52766749	95.52162904	93.56610777	91.65948858	89.80022085	87.9868153	86.21784105
200224A00002	2/24/2020	1.56	2/24/2023	2/24/2020	100.14438	99.98943004	99.83496154	99.68097379	99.52746456	99.37443163	99.22187281	99.0697859	98.91816872
200224A00007	2/24/2020	1.59	2/24/2025	2/24/2020	101.6981	99.58590607	97.52766749	95.52162904	93.56610777	91.65948858	89.80022085	87.9868153	86.21784105
200224A00015	2/24/2020	1.57	1/10/2024	2/24/2020	100.40075	99.38312378	98.38602715	97.40884684	96.45099082	95.51189029	94.59099859	93.68779012	92.80175936
200224A00019	2/24/2020	1.59	2/18/2025	2/24/2020	101.67197	99.57673777	97.53472242	95.5442091	93.6035483	91.71115647	89.86551275	88.06515599	86.30868186
200224A00020	2/24/2020	1.59	2/24/2025	2/24/2020	101.6981	99.58590607	97.52766749	95.52162904	93.56610777	91.65948858	89.80022085	87.9868153	86.21784105
200224A00021	2/24/2020	1.58	9/24/2024	2/24/2020	101.11202	99.41250347	97.74935949	96.12148591	94.52782462	92.96736018	91.43911761	89.94216035	88.47558832
200224A00024	2/24/2020	1.59	2/24/2025	2/24/2020	101.6981	99.58590607	97.52766749	95.52162904	93.56610777	91.65948858	89.80022085	87.9868153	86.21784105
200224A00025	2/24/2020	1.59	1/23/2025	2/24/2020	101.56317	99.54017063	97.56735674	95.64315444	93.7660514	91.93459355	90.14738235	88.40307221	86.70036811
200224A00029	2/24/2020	1.56	2/24/2023	2/24/2020	100.14438	99.98943004	99.83496154	99.68097379	99.52746456	99.37443163	99.22187281	99.0697859	98.91816872
200224A00046	2/24/2020	1.59	2/24/2025	2/24/2020	101.6981	99.58590607	97.52766749	95.52162904	93.56610777	91.65948858	89.80022085	87.9868153	86.21784105
200225A00012	2/25/2020	1.57	2/25/2025	2/25/2020	101.65917	99.54462922	97.4841548	95.47598798	93.51844047	91.60989215	89.74878764	87.93363321	86.16299375
200225A00015	2/25/2020	1.54	2/26/2024	2/25/2020	100.41417	99.27294628	98.15752023	97.06702079	96.00062016	94.95752681	93.93698355	92.93826563	91.96067908
200225A00017	2/25/2020	1.94	2/25/2030	2/25/2020	108.94186	101.9111789	95.38312154	89.31914427	83.68384962	78.44471502	73.5718451	69.03774658	64.81712349
200225A00018	2/25/2020	1.94	2/25/2030	2/25/2020	108.94186	101.9111789	95.38312154	89.31914427	83.68384962	78.44471502	73.5718451	69.03774658	64.81712349
200225A00050	2/25/2020	1.57	2/25/2025	2/25/2020	101.65917	99.54462922	97.4841548	95.47598798	93.51844047	91.60989215	89.74878764	87.93363321	86.16299375
200226A00005	2/26/2020	1.53	2/27/2023	2/26/2020	100.14252	99.97931545	99.81664103	99.65449368	99.49287087	99.33177009	99.17118887	99.01112471	98.85157516
200226A00006	2/26/2020	1.57	2/26/2025	2/26/2020	101.66347	99.54610423	97.48292813	95.47217659	93.51215572	91.60124008	89.73786931	87.92054496	86.14782744
200226A00008	2/26/2020	1.38	2/26/2025	2/26/2020	101.70293	99.5762376	97.50413187	95.48482977	93.51662085	91.59786396	89.72698387	87.90246798	86.1228633
200226A00009	2/26/2020	1.75	2/26/2030	2/26/2020	109.1957	102.0863552	95.48764094	89.3602552	83.66811298	78.37807006	73.45966872	68.88490682	64.62802778
200226A00014	2/26/2020	1.53	2/27/2023	2/26/2020	100.14252	99.97931545	99.81664103	99.65449368	99.49287087	99.33177009	99.17118887	99.01112471	98.85157516

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200226A00015	2/26/2020	1.53	2/26/2024	2/26/2020	100.4025	99.26135017	98.14599505	97.05556544	95.98923356	94.94620792	93.92573135	92.92707912	91.94955729
200226A00016	2/26/2020	1.57	2/26/2025	2/26/2020	101.66347	99.54610423	97.48292813	95.47217659	93.51215572	91.60124008	89.73786931	87.92054496	86.14782744
200226A00025	2/26/2020	1.38	2/26/2025	2/26/2020	101.70293	99.5762376	97.50413187	95.48482977	93.51662085	91.59786396	89.72698387	87.90246798	86.1228633
200227A00004	2/27/2020	1.65	2/27/2030	2/27/2020	108.48143	101.3944198	94.81713823	88.71031783	83.03790848	77.7668	72.86656776	68.30924169	64.06909624
200227A00005	2/27/2020	1.43	2/27/2024	2/27/2020	100.28675	99.14369604	98.02653793	96.93440532	95.86646527	94.82192143	93.80001206	92.80000813	91.82121161
200227A00006	2/27/2020	1.47	2/27/2025	2/27/2020	101.45081	99.333019	97.26948879	95.25845306	93.29821362	91.38714105	89.52367124	87.70630221	85.93359108
200227A00009	2/27/2020	1.47	2/27/2025	2/27/2020	101.45081	99.333019	97.26948879	95.25845306	93.29821362	91.38714105	89.52367124	87.70630221	85.93359108
200227A00012	2/27/2020	1.41	2/27/2023	2/27/2020	100.12287	99.95968757	99.79703791	99.63491526	99.47331708	99.31224088	99.15168416	98.99164444	98.83211926
200227A00013	2/27/2020	1.43	2/27/2024	2/27/2020	100.28675	99.14369604	98.02653793	96.93440532	95.86646527	94.82192143	93.80001206	92.80000813	91.82121161
200227A00016	2/27/2020	1.47	2/27/2025	2/27/2020	101.45081	99.333019	97.26948879	95.25845306	93.29821362	91.38714105	89.52367124	87.70630221	85.93359108
200227A00022	2/27/2020	1.41	2/27/2023	2/27/2020	100.12287	99.95968757	99.79703791	99.63491526	99.47331708	99.31224088	99.15168416	98.99164444	98.83211926
200227A00026	2/27/2020	1.41	2/27/2023	2/27/2020	100.12287	99.95968757	99.79703791	99.63491526	99.47331708	99.31224088	99.15168416	98.99164444	98.83211926
200227A00027	2/27/2020	1.47	2/27/2025	2/27/2020	101.45081	99.333019	97.26948879	95.25845306	93.29821362	91.38714105	89.52367124	87.70630221	85.93359108
200227A00030	2/27/2020	1.59	2/27/2026	2/27/2020	103.16151	100.0576051	97.06274906	94.17247807	91.38253933	88.6888804	86.0876383	83.57512938	81.14783968
200227A00031	2/27/2020	1.43	2/27/2024	2/27/2020	100.28675	99.14369604	98.02653793	96.93440532	95.86646527	94.82192143	93.80001206	92.80000813	91.82121161
200227A00052	2/27/2020	1.41	2/27/2023	2/27/2020	100.12287	99.95968757	99.79703791	99.63491526	99.47331708	99.31224088	99.15168416	98.99164444	98.83211926
200228A00005	2/28/2020	1.35	2/28/2024	2/28/2020	100.1939	99.04880127	97.9297036	96.83573363	95.76605319	94.71986102	93.69639073	92.69490894	91.71471349
200228A00012	3/3/2020	1.4	3/3/2025	3/3/2020	101.3132	99.18613352	97.11378801	95.09437247	93.12616688	91.2075212	89.33685193	87.5126388	85.73342168
200228A00014	2/28/2020	1.4	2/28/2025	2/28/2020	101.30278	99.18385295	97.11928021	95.10728573	93.14616669	91.23428927	89.37008523	87.55204872	85.77873321
200228A00015	3/3/2020	1.34	10/16/2023	3/3/2020	100.13926	99.35068871	98.57448673	97.81036607	97.05804633	96.31725572	95.58773074	94.86921589	94.16146331
200228A00016	2/28/2020	1.35	2/22/2024	2/28/2020	100.20089	99.07131487	97.96704869	96.88725275	95.83112112	94.79788295	93.78680051	92.79716746	91.82830721
200228A00019	2/28/2020	1.21	2/20/2025	2/28/2020	101.31014	99.20453648	97.1527009	95.15288383	93.20341097	91.30267537	89.44913407	87.64130498	85.87776401
200228A00020	2/28/2020	1.32	2/24/2023	2/28/2020	100.10707	99.95216806	99.7977457	99.64380397	99.49034063	99.33735348	99.18484031	99.03279894	98.88122719
200228A00025	2/28/2020	1.57	3/2/2027	2/28/2020	104.7474	100.6441153	96.72360568	92.97674485	89.39491456	85.96997354	82.69422811	79.56040484	76.56162517
200228A00026	2/28/2020	2.14	2/28/2035	2/28/2020	113.27315	101.6452423	91.34170619	82.20381652	74.09264935	66.88652024	60.47876659	54.77582507	49.69556357
200228A00030	2/28/2020	1.32	2/28/2023	2/28/2020	100.109	99.94308728	99.77772052	99.6128965	99.4486126	99.28486619	99.1216547	98.95897553	98.79682614
200228A00031	2/28/2020	1.35	2/28/2024	2/28/2020	100.1939	99.04880127	97.9297036	96.83573363	95.76605319	94.71986102	93.69639073	92.69490894	91.71471349
200228A00039	2/28/2020	1.33	4/28/2023	2/28/2020	100.14398	99.81613088	99.49042569	99.1668397	98.84535235	98.52594329	98.20859248	97.89328012	97.57998665
200228A00059	2/28/2020	1.79	2/28/2030	2/28/2020	107.88201	100.8803784	94.38058542	88.34407692	82.73545231	77.52219049	72.67440144	68.16460035	63.96750243
200228A00063	2/28/2020	1.32	2/28/2023	2/28/2020	100.109	99.94308728	99.77772052	99.6128965	99.4486126	99.28486619	99.1216547	98.95897553	98.79682614
200228A00066	2/28/2020	1.35	2/28/2024	2/28/2020	100.1939	99.04880127	97.9297036	96.83573363	95.76605319	94.71986102	93.69639073	92.69490894	91.71471349
200228A00067	2/28/2020	1.4	2/28/2025	2/28/2020	101.30278	99.18385295	97.11928021	95.10728573	93.14616669	91.23428927	89.37008523	87.55204872	85.77873321
200302A00008	3/2/2020	1.2	3/9/2023	3/2/2020	100.08829	99.89765351	99.70775272	99.5185827	99.3301392	99.14241799	98.95541489	98.76912575	98.58354645

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200302A00011	3/2/2020	1.31	2/27/2025	3/2/2020	101.10368	98.98972248	96.92994801	94.92259249	92.96595992	91.05842296	89.19841949	87.38444948	85.61507192
200302A00028	3/2/2020	1.25	2/26/2024	3/2/2020	100.07579	98.9366591	97.82329008	96.73481568	95.67040891	94.62927908	93.61066972	92.61385686	91.63814724
200302A00033	3/2/2020	1.31	3/3/2025	3/2/2020	101.11696	98.99206782	96.92185545	94.90453003	92.93837279	91.02173489	89.15303395	87.33075083	85.55342645
200302A00034	3/2/2020	1.25	3/1/2024	3/2/2020	100.0779	98.92828018	97.80488773	96.70683779	95.63328117	94.58340625	93.55643687	92.55163046	91.56827622
200302A00035	3/2/2020	1.22	7/3/2023	3/2/2020	100.11768	99.61042141	99.10828325	98.6111893	98.11906391	97.63183291	97.14942361	96.67176477	96.19878652
200302A00036	3/2/2020	1.45	3/2/2026	3/2/2020	102.73095	99.6257855	96.63001391	93.73914306	90.94889644	88.25519965	85.65416928	83.1421027	80.71546833
200302A00045	3/4/2020	1.31	3/4/2025	3/4/2020	101.12019	98.992588	96.91979045	94.89999723	92.93148379	91.01259588	89.14174604	87.31741029	85.53812503
200302A00051	3/2/2020	1.22	8/8/2023	3/2/2020	100.09019	99.48609088	98.88926565	98.29957995	97.71690619	97.14111981	96.5720992	96.00972559	95.45388298
200302A00053	3/2/2020	1.31	3/3/2025	3/2/2020	101.11696	98.99206782	96.92185545	94.90453003	92.93837279	91.02173489	89.15303395	87.33075083	85.55342645
200302A00054	3/2/2020	1.31	3/3/2025	3/2/2020	101.11696	98.99206782	96.92185545	94.90453003	92.93837279	91.02173489	89.15303395	87.33075083	85.55342645
200303A00001	3/3/2020	1.15	3/3/2025	3/3/2020	101.22107	99.08605431	97.0061372	94.97950496	93.00442154	91.07922175	89.20230771	87.37214554	85.58726219
200303A00002	3/3/2020	1.06	3/3/2023	3/3/2020	100.09913	99.92461313	99.7507129	99.57742199	99.40473716	99.23265522	99.06117298	98.89028729	98.71999502
200303A00007	3/3/2020	1.11	3/4/2024	3/3/2020	100.14605	98.98462203	97.84993112	96.74106712	95.65715695	94.59736652	93.5608985	92.54699036	91.55491246
200303A00010	3/3/2020	1.34	3/3/2025	3/3/2020	101.18237	99.05675639	96.98583297	94.96781085	93.00097082	91.08366366	89.21430661	87.39138015	85.61342486
200303A00012	3/3/2020	1.71	3/1/2030	3/3/2020	107.31438	100.330025	93.84685632	87.82634018	82.23309709	77.03462714	72.20106133	67.7049357	63.52098599
200303A00018	3/3/2020	1.27	3/3/2025	3/3/2020	101.02974	98.9058164	96.83655208	94.82015562	92.85490875	90.93916319	89.07133708	87.24991173	85.47342857
200303A00034	3/3/2020	1.21	3/3/2025	3/3/2020	100.89891	98.77643926	96.70859704	94.69359399	92.7297127	90.81530565	88.94879176	87.12865308	85.35343174
200304A00010	3/4/2020	1.2	3/4/2027	3/4/2020	104.09759	99.97687325	96.04073734	92.27991912	88.6856775	85.24975731	81.96435922	78.82211183	75.81604557
200304A00021	3/4/2020	0.94	3/4/2024	3/4/2020	99.944185	98.78402116	97.65057835	96.54294268	95.46024163	94.40164159	93.36634571	92.35359192	91.36265106
200304A00034	3/4/2020	1.12	3/4/2024	3/4/2020	99.926081	98.76954082	97.63958111	96.53529442	95.45581435	94.40031306	93.3679992	92.35811587	91.36993877
200304A00040	3/4/2020	1.12	3/1/2024	3/4/2020	99.924794	98.77612298	97.65366873	96.55654226	95.4838948	94.43491507	93.40882728	92.4048892	91.42239036
200304A00052	3/6/2020	2.11	3/8/2027	3/6/2020	107.03379	102.8669434	98.88574285	95.08090391	91.44365759	87.96572159	84.63927024	81.45690654	78.4116361
200304A00053	3/6/2020	2.33	3/6/2025	3/6/2020	103.35909	101.2012073	99.09888523	97.05029467	95.05368535	93.10737855	91.20976343	89.35929372	87.55448453
200304A00054	3/6/2020	2.35	3/8/2027	3/6/2020	108.03813	103.850389	99.8489748	96.02457002	92.36837956	88.87209623	85.52787067	82.3282833	79.26631819
200305A00002	3/5/2020	1.14	3/5/2025	3/5/2020	100.75181	98.62563225	96.55429895	94.53600571	92.56902459	90.65169819	88.7824361	86.95971162	85.18205861
200305A00007	3/5/2020	1.14	3/5/2025	3/5/2020	100.75181	98.62563225	96.55429895	94.53600571	92.56902459	90.65169819	88.7824361	86.95971162	85.18205861
200305A00008	3/10/2020	1.01	6/19/2023	3/10/2020	100.01943	99.55037066	99.08570195	98.6253651	98.16929966	97.71744633	97.26974688	96.82614418	96.38658212
200305A00009	3/10/2020	1.04	10/18/2023	3/10/2020	99.896943	99.10412373	98.32382991	97.55576633	96.79964724	96.0551957	95.32214329	94.60022978	93.88920278
200305A00012	3/5/2020	1.14	3/5/2025	3/5/2020	100.75181	98.62563225	96.55429895	94.53600571	92.56902459	90.65169819	88.7824361	86.95971162	85.18205861
200305A00020	3/5/2020	0.95	3/5/2025	3/5/2020	100.78961	98.6540302	96.57369222	94.54677925	92.57154641	90.64632023	88.7694951	86.9395299	85.15494478
200305A00029	3/5/2020	1.14	3/5/2025	3/5/2020	100.75181	98.62563225	96.55429895	94.53600571	92.56902459	90.65169819	88.7824361	86.95971162	85.18205861
200305A00035	3/5/2020	1.25	3/5/2026	3/5/2020	102.10694	99.00373335	96.01017494	93.12175296	90.33416979	87.64333147	85.04533657	82.53646577	80.11317204
200305A00036	3/5/2020	1.36	3/5/2027	3/5/2020	103.88365	99.79028581	95.8797895	92.14300528	88.57129169	85.1564866	81.89087764	78.76717469	75.77848423

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200305A00040	3/10/2020	0.99	3/10/2023	3/10/2020	100.04741	99.85408635	99.66151671	99.46969929	99.27862964	99.08830335	98.89871605	98.7098634	98.5217411
200306A00001	3/6/2020	1.11	3/6/2026	3/6/2020	101.66472	98.56591149	95.57674403	92.69269684	89.90946847	87.22296154	84.62927154	82.12467642	79.70562673
200306A00012	3/6/2020	0.95	3/6/2024	3/6/2020	99.736008	98.57524841	97.44130058	96.33324438	95.2502018	94.1913341	93.15583968	92.14295199	91.15193767
200306A00014	3/6/2020	1.38	3/6/2030	3/6/2020	104.96904	98.05405801	91.63785682	85.68195322	80.15102523	75.01263383	70.23697342	65.79664512	61.66645074
200306A00030	3/6/2020	0.88	3/6/2023	3/6/2020	100.02991	99.84760197	99.66596314	99.48499082	99.30468134	99.12503103	98.94603627	98.76769345	98.589999
200306A00039	3/6/2020	0.88	3/6/2023	3/6/2020	100.02991	99.84760197	99.66596314	99.48499082	99.30468134	99.12503103	98.94603627	98.76769345	98.589999
200306A00046	3/6/2020	1.01	3/3/2025	3/6/2020	100.46282	98.34518215	96.28208022	94.2717219	92.31239251	90.40244718	88.54030737	86.72445759	84.95344233
200306A00065	3/6/2020	1.38	3/6/2030	3/6/2020	104.96904	98.05405801	91.63785682	85.68195322	80.15102523	75.01263383	70.23697342	65.79664512	61.66645074
200309A00004	3/9/2020	0.71	3/8/2024	3/9/2020	99.67047	98.50151786	97.35974809	96.24422248	95.15404544	94.08836166	93.04635393	92.02724102	91.03027571
200309A00005	3/9/2020	0.77	3/7/2025	3/9/2020	100.3999	98.26330129	96.1821093	94.15449152	92.17869395	90.2530346	88.37589986	86.54574111	84.76107147
200309A00019	3/9/2020	0.89	3/11/2024	3/9/2020	99.651904	98.47877399	97.33304915	96.21377897	95.12005629	94.05101498	93.00582764	91.98370352	90.98388641
200309A00020	3/9/2020	0.96	3/10/2025	3/9/2020	100.36971	98.23447197	96.15460744	94.12828316	92.15374486	90.22931035	88.35336595	86.52436302	84.74081479
200309A00021	3/9/2020	1.05	3/9/2026	3/9/2020	101.48266	98.37881148	95.38504508	92.49681181	89.70978301	87.01983593	84.42304241	81.91565837	79.49411378
200309A00027	3/9/2020	0.97	3/10/2025	3/9/2020	100.3917	98.25622166	96.17611601	94.14955551	92.17478572	90.25012433	88.37395753	86.54473655	84.76097449
200309A00033	3/9/2020	1.06	3/9/2026	3/9/2020	101.51458	98.41022258	95.41595861	92.52724069	89.73973974	87.04933257	84.45209063	81.94426944	79.52229861
200309A00046	3/9/2020	0.78	3/11/2025	3/9/2020	100.43133	98.2836637	96.19190485	94.15419958	92.16877036	90.23391306	88.34799319	86.50944243	84.71675532
200310A00019	3/10/2020	0.95	3/10/2023	3/10/2020	100.03964	99.84632658	99.65376797	99.46196153	99.27090283	99.08058745	98.89101104	98.70216924	98.51405775
200310A00025	3/10/2020	0.87	3/11/2024	3/10/2020	99.86309	98.68502945	97.53453951	96.41066221	95.31248346	94.23913056	93.18976995	92.16360498	91.15987393
200310A00042	3/10/2020	1.41	3/11/2030	3/10/2020	105.18678	98.2516798	91.81749791	85.84552846	80.30024973	75.14904393	70.3619454	65.91141189	61.77211676
200310A00065	3/13/2020	1.1	3/13/2025	3/13/2020	100.68562	98.53884904	96.44789593	94.41090572	92.4261047	90.49179238	88.60633775	86.76817584	84.97580438
200310A00073	3/12/2020	2.12	3/11/2027	3/12/2020	107.09346	102.9172752	98.92745321	95.11465712	91.4700702	87.98536598	84.65267795	81.46457129	78.41401655
200311A00006	3/13/2020	1.12	3/10/2025	3/13/2020	100.72164	98.58246703	96.49874463	94.46864065	92.49039854	90.56233396	88.68283113	86.8503394	85.06337006
200311A00040	3/12/2020	1.3	3/11/2025	3/12/2020	101.12077	98.97445565	96.88381023	94.84698941	92.8622283	90.92783463	89.04218511	87.20372197	85.41094972
200311A00056	3/13/2020	1.27	4/10/2024	3/13/2020	100.17158	98.91726576	97.69030806	96.48980768	95.3149094	94.1647949	93.03868077	91.93581664	90.85548347
200312A00004	3/13/2020	1.23	1/24/2025	3/13/2020	100.81926	98.80153573	96.83394511	94.91491528	93.04293347	91.21654524	89.4343518	87.69500739	85.99721687
200312A00016	3/16/2020	1.09	2/15/2023	3/16/2020	100.07417	99.94407334	99.81433023	99.68493673	99.5558914	99.42719281	99.29883954	99.17083017	99.0431633
200312A00017	3/16/2020	1.09	2/15/2023	3/16/2020	100.07417	99.94407334	99.81433023	99.68493673	99.5558914	99.42719281	99.29883954	99.17083017	99.0431633
200312A00042	3/16/2020	1.38	3/16/2023	3/16/2020	100.1257	99.91576803	99.706732	99.4985814	99.29131055	99.08491384	98.87938571	98.67472063	98.47091313
200313A00032	3/18/2020	1.46	3/18/2025	3/18/2020	101.4986	99.32932925	97.21667719	95.15876129	93.15377339	91.19998041	89.29572056	87.43939972	85.62948805
200317A00026	3/17/2020	1.22	3/15/2024	3/17/2020	100.0643	98.87788052	97.71941	96.58790758	95.48244066	94.40211918	93.34609327	92.31355092	91.30371599
200317A00065	3/19/2020	2.05	3/19/2025	3/19/2020	102.81449	100.6276561	98.49787697	96.42324993	94.40195232	92.43223723	90.51242969	88.640923	86.81617528
200318A00043	3/18/2020	1.06	3/20/2023	3/18/2020	100.10051	99.87917255	99.6588221	99.43945572	99.22106674	99.00364858	98.78719472	98.57169866	98.35715401
200325A00029	3/25/2020	1.15	3/24/2023	3/25/2020	100.12183	99.88944389	99.65814657	99.42792776	99.19877988	98.97069543	98.74366699	98.51768718	98.29274871

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200325A00030	3/25/2020	1.5	3/25/2025	3/25/2020	102.08154	99.87751882	97.73155862	95.64170052	93.60607314	91.62288374	89.69041415	87.80701697	85.97111197
200326A00026	3/26/2020	1.32	3/26/2024	3/26/2020	100.19697	98.98087563	97.79410232	96.63559985	95.5043682	94.39945401	93.31994788	92.26498185	91.2337271
200326A00028	3/26/2020	1.54	3/26/2025	3/26/2020	101.70717	99.51412244	97.37875008	95.29911496	93.27336027	91.29970711	89.37645046	87.50195548	85.67465385
200326A00029	3/26/2020	1.82	3/26/2027	3/26/2020	105.91242	101.7206275	97.71778412	93.89433352	90.24125757	86.75004466	83.41265802	80.22150617	77.16941553
200326A00030	3/26/2020	1.13	3/24/2023	3/26/2020	100.07079	99.83897845	99.60824639	99.37858473	99.14998604	98.92244294	98.69594814	98.47049439	98.24607453
200327A00036	3/27/2020	0.77	9/27/2023	3/27/2020	99.853042	99.11440396	98.38663479	97.6694965	96.96275762	96.26619339	95.57958547	94.90272172	94.23539599
200327A00074	3/31/2020	1.76	3/29/2024	3/31/2020	100.75196	99.52434805	98.32649079	97.15731824	96.01581017	94.90099422	93.81194311	92.74777204	91.70763631
200327A00075	3/31/2020	1.75	3/29/2024	3/31/2020	100.73942	99.51188595	98.31411009	97.14501759	96.00358826	94.88884976	93.79987485	92.73577878	91.69571686
200330A00041	4/1/2020	1.09	4/1/2025	4/1/2020	100.71283	98.51529371	96.37596338	94.29287861	92.26416115	90.28801148	88.36270476	86.48658704	84.65807165
200330A00045	3/30/2020	1.47	3/30/2027	3/30/2020	104.44725	100.275632	96.29286513	92.48936154	88.85608002	85.38448878	82.06653343	78.89460726	75.86152355
200331A00060	3/31/2020	1.09	3/31/2025	3/31/2020	100.71053	98.51560124	96.37875262	94.2980203	92.27152814	90.29747894	88.3741503	86.49989082	84.67311651
200402A00011	4/2/2020	0.8	3/31/2023	4/2/2020	99.986029	99.73515742	99.48553878	99.23716417	98.99002436	98.7441102	98.49941263	98.25592269	98.01363149
200402A00021	4/2/2020	0.77	10/2/2024	4/2/2020	100.05639	98.33931935	96.65948995	95.01576428	93.40705446	91.83231653	90.29054818	88.78078663	87.30210667
200403A00006	4/3/2020	1.05	4/3/2025	4/3/2020	100.62684	98.42511836	96.28184626	94.1950576	92.16287042	90.18348114	88.25516058	86.37625016	84.54515839
200403A00014	4/3/2020	0.63	4/17/2023	4/3/2020	99.982014	99.68396689	99.38770758	99.09322028	98.80048903	98.50949803	98.2202317	97.93267462	97.64681156
200403A00016	4/3/2020	0.63	4/17/2023	4/3/2020	99.982014	99.68396689	99.38770758	99.09322028	98.80048903	98.50949803	98.2202317	97.93267462	97.64681156
200406A00006	4/6/2020	1.13	4/7/2025	4/6/2020	100.8177	98.6034382	96.44819187	94.34999057	92.30694233	90.31723295	88.37912212	86.4909397	84.65108232
200407A00001	4/8/2020	2.41	4/7/2025	4/8/2020	103.73098	101.4830303	99.2948025	97.16430138	95.08961504	93.06891013	91.10042787	89.18248041	87.31344728
200407A00002	4/8/2020	1.82	4/8/2024	4/8/2020	100.87052	99.61657021	98.3905018	97.1913812	96.01831986	94.87046827	93.74701379	92.64717868	91.57021824
200408A00021	4/8/2020	0.99	4/4/2025	4/8/2020	100.96382	98.74611618	96.58749638	94.48597604	92.43965028	90.44669351	88.50535537	86.61395699	84.77088734
200414A00016	4/16/2020	1.64	4/15/2024	4/16/2020	100.66815	99.39777332	98.15368757	96.9350852	95.74118818	94.57125034	93.42455573	92.30041705	91.19817428
200415A00030	4/15/2020	0.76	3/15/2023	4/15/2020	99.996235	99.78924849	99.58312996	99.37787371	99.17347429	98.9699263	98.76722437	98.56536319	98.36433749
200415A00035	4/17/2020	2.16	4/16/2025	4/17/2020	103.20901	100.9435303	98.73884841	96.59295105	94.5039093	92.46987115	90.4890578	88.5597602	86.68033578
200417A00009	4/17/2020	1.35	4/16/2027	4/17/2020	103.99572	99.78979371	95.77626537	91.94534138	88.28778063	84.79485888	81.45833702	78.27043137	75.22378601
200417A00016	4/21/2020	2.18	4/21/2025	4/21/2020	103.28142	101.0020082	98.78408276	96.62561882	94.52467515	92.47938656	90.48796039	88.54867321	86.65986766
200420A00047	4/20/2020	0.77	4/20/2023	4/20/2020	99.965384	99.65977928	99.35604883	99.05417491	98.75414051	98.4559288	98.15952315	97.86490714	97.57206457
200424A00006	4/24/2020	0.6	4/24/2023	4/24/2020	99.967813	99.65060397	99.33541158	99.02221695	98.71100109	98.40174522	98.09443081	97.78903958	97.48555345
200428A00011	4/30/2020	1.95	4/29/2025	4/30/2020	102.78637	100.4919025	98.2598757	96.08825162	93.97507288	91.91845678	89.91659195	87.96773524	86.07020873
200428A00013	4/30/2020	1.49	4/29/2024	4/30/2020	100.524	99.21906185	97.93730703	96.67816447	95.44108256	94.22552731	93.03098161	91.85694457	90.70293093
200429A00003	4/29/2020	0.74	4/28/2023	4/29/2020	99.949261	99.62181794	99.29651303	98.97332538	98.65223442	98.33321985	98.01626162	97.70133994	97.38843528
200429A00009	4/29/2020	0.78	4/29/2025	4/29/2020	100.53701	98.25926688	96.04384995	93.88872427	91.79192908	89.75157865	87.76585892	85.83302438	83.95139501
200429A00010	4/29/2020	0.78	4/29/2025	4/29/2020	100.53701	98.25926688	96.04384995	93.88872427	91.79192908	89.75157865	87.76585892	85.83302438	83.95139501
200429A00015	4/29/2020	0.66	4/29/2024	4/29/2020	99.660629	98.35781659	97.07821	95.8212377	94.58634672	93.37300179	92.18068461	91.00889321	89.85714128

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200429A00018	5/4/2020	0.73	4/17/2023	5/4/2020	99.952778	99.65543585	99.35987037	99.06606528	98.77400482	98.48367343	98.19505571	97.90813648	97.62290069
200429A00035	5/1/2020	1.41	4/30/2024	5/1/2020	100.42028	99.11352944	97.82973338	96.56833514	95.32879991	94.11060944	92.91326142	91.73626885	90.5791595
200429A00043	5/1/2020	1.56	4/30/2025	5/1/2020	101.8789	99.59259687	97.36863511	95.2049876	93.099701	91.05089623	89.05676514	87.11556749	85.22562797
200429A00044	5/1/2020	1.86	4/30/2025	5/1/2020	102.58053	100.2858989	98.05378918	95.88216491	93.76906775	91.71261373	89.71099007	87.76245202	85.86531995
200429A00045	5/1/2020	1.54	4/30/2025	5/1/2020	101.83213	99.54637674	97.32295818	95.15984244	93.05507655	91.00678173	89.01315015	87.07244186	85.18298184
200429A00046	5/1/2020	2.07	4/30/2025	5/1/2020	103.07167	100.7712103	98.53339703	96.35618904	94.23762447	92.17581599	90.16894752	88.21527119	86.31310434
200429A00047	5/1/2020	2.7	4/30/2025	5/1/2020	104.54508	102.2271446	99.97222057	97.7782614	95.64329464	93.56542274	91.54281987	89.5737287	87.6564575
200429A00050	5/1/2020	2.61	4/30/2025	5/1/2020	104.3346	102.019154	99.76667435	97.57510821	95.44248461	93.36690749	91.34655239	89.37966334	87.4645499
200429A00051	5/1/2020	2.54	4/30/2025	5/1/2020	104.17088	101.8573835	99.60680507	97.41710017	95.28629904	93.21250674	91.19389991	89.22872362	87.31528844
200429A00052	5/1/2020	1.43	4/30/2024	5/1/2020	100.44712	99.14018229	97.85620088	96.59462039	95.35490594	94.13653919	92.93901774	91.76185454	90.60457727
200429A00053	5/1/2020	2.18	4/30/2025	5/1/2020	103.32893	101.0254211	98.78462019	96.60448739	94.48305894	92.41844574	90.40882999	88.45246218	86.54765807
200429A00056	5/1/2020	1.54	4/30/2025	5/1/2020	101.83213	99.54637674	97.32295818	95.15984244	93.05507655	91.00678173	89.01315015	87.07244186	85.18298184
200429A00058	5/1/2020	1.83	4/30/2025	5/1/2020	102.51037	100.2165687	97.98527377	95.81444718	93.70213107	91.64644198	89.64556758	87.69776357	85.80135076
200430A00007	4/30/2020	0.72	4/28/2023	4/30/2020	99.94266	99.61523106	99.28993972	98.96676557	98.64568805	98.32668685	98.00974193	97.69483349	97.38194201
200430A00008	4/30/2020	0.94	4/30/2025	4/30/2020	100.42888	98.15977266	95.95265004	93.80548781	91.71634306	89.68334672	87.70470029	85.7786728	83.90359788
200430A00009	4/30/2020	1.16	4/30/2026	4/30/2020	101.99749	98.74982606	95.6217125	92.60815574	89.70439413	86.90588816	84.20830899	81.60752753	79.09960424
200430A00016	4/30/2020	0.82	4/30/2024	4/30/2020	99.628454	98.32727019	97.04894206	95.79292011	94.55867201	93.34568192	92.15344984	90.98149101	89.82933535
200430A00017	4/30/2020	0.94	4/30/2025	4/30/2020	100.42888	98.15977266	95.95265004	93.80548781	91.71634306	89.68334672	87.70470029	85.7786728	83.90359788
200501A00003	5/1/2020	0.66	4/14/2023	5/1/2020	99.935138	99.64603529	99.35861374	99.07285827	98.78875436	98.50628764	98.22544393	97.94620918	97.66856955
200504A00004	5/4/2020	0.75	5/5/2025	5/4/2020	100.47999	98.1869599	95.95708838	93.78829974	91.67859839	89.62606527	87.62885449	85.68519006	83.79336284
200504A00015	5/4/2020	0.68	5/4/2023	5/4/2020	99.923174	99.57941062	99.23800727	98.89893984	98.5621844	98.22771738	97.89551553	97.56555589	97.23781583
200505A00004	5/5/2020	0.77	5/5/2025	5/5/2020	100.52716	98.23356239	96.00313847	93.83380911	91.72357837	89.67052688	87.6728084	85.72864664	83.83633218
200505A00005	5/5/2020	0.77	5/5/2025	5/5/2020	100.52716	98.23356239	96.00313847	93.83380911	91.72357837	89.67052688	87.6728084	85.72864664	83.83633218
200506A00002	5/8/2020	0.97	5/5/2025	5/8/2020	100.51041	98.22706179	96.0064177	93.84642047	91.74509423	89.70053863	87.71092552	85.7744958	83.8895564
200506A00005	5/6/2020	0.97	5/6/2025	5/6/2020	100.51268	98.22665388	96.00346915	93.84106553	91.73746062	89.69074787	87.69909329	85.76073219	83.87396622
200506A00010	5/6/2020	0.94	5/6/2026	5/6/2020	101.9823	98.70130128	95.54203923	92.49938822	89.56846473	86.74461491	84.02340254	81.40059771	78.87216612
200508A00004	5/8/2020	0.43	5/8/2023	5/8/2020	99.896452	99.5410866	99.18825291	98.83792359	98.49007195	98.14467168	97.80169683	97.46112183	97.12292147
200511A00015	5/11/2020	0.6	2/1/2023	5/11/2020	100.02943	99.93798831	99.84671763	99.75561618	99.66468349	99.57391909	99.48332253	99.39289332	99.302631
200511A00016	5/11/2020	0.71	2/1/2024	5/11/2020	99.482316	98.41209152	97.36470692	96.33943794	95.33559081	94.35250052	93.38952929	92.44606523	91.52152101
200511A00017	5/11/2020	0.83	2/3/2025	5/11/2020	100.00758	97.97189907	95.98728686	94.05212164	92.16484547	90.32396135	88.52803037	86.77566893	85.06554618
200511A00018	5/11/2020	0.98	2/2/2026	5/11/2020	101.15384	98.15042533	95.2509487	92.45122696	89.7472742	87.13528822	84.61164085	82.17286884	79.81566526
200511A00019	5/11/2020	1.18	2/1/2027	5/11/2020	103.01108	99.02321523	95.21050684	91.56434576	88.07659151	84.73954608	81.54592736	78.48884428	75.56177357
200511A00020	5/11/2020	1.4	2/1/2028	5/11/2020	104.99496	100.011889	95.29333852	90.82391326	86.58919511	82.57567482	78.77068976	75.16236643	71.73956717

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200511A00021	5/11/2020	1.53	2/1/2029	5/11/2020	105.92613	99.97964148	94.40288348	89.17099433	84.26091095	79.65122706	75.3220658	71.25496283	67.43275897
200511A00022	5/11/2020	1.6	2/1/2030	5/11/2020	106.48815	99.60587204	93.21327745	87.27304692	81.75088733	76.61527129	71.83720068	67.38999163	63.24907874
200511A00023	5/11/2020	1.7	2/3/2031	5/11/2020	107.8008	99.96169974	92.74931156	86.11030779	79.99615257	74.36265094	69.16954013	64.38012129	59.96092741
200511A00028	5/13/2020	1.02	5/13/2024	5/13/2020	99.915584	98.57758803	97.26365853	95.97320333	94.70564881	93.4604396	92.2370378	91.03492237	89.85358841
200513A00002	5/13/2020	0.56	5/13/2024	5/13/2020	99.537242	98.19788324	96.8826772	95.5910285	94.32236042	93.07611464	91.85175049	90.64874428	89.46658864
200513A00003	5/13/2020	0.68	5/13/2025	5/13/2020	100.33144	98.01882479	95.77047135	93.58424585	91.45810083	89.39006807	87.37825511	85.42084179	83.51607715
200515A00001	5/15/2020	0.59	5/15/2023	5/15/2020	99.877609	99.50396635	99.13312123	98.76504176	98.399697	98.0370565	97.67709024	97.31976864	96.96506258
200529A00004	5/29/2020	0.56	5/29/2024	5/29/2020	99.548469	98.16613251	96.80943898	95.4777386	94.17040261	92.8868229	91.62641115	90.38859805	89.17283252
200529A00009	5/29/2020	0.42	5/30/2023	5/29/2020	99.865255	99.44989837	99.03798243	98.62946426	98.22430202	97.82245453	97.42388131	97.02854252	96.63639896
200601A00006	6/1/2020	0.6	6/1/2023	6/1/2020	99.863151	99.44323073	99.02682768	98.61389761	98.20439726	97.7982841	97.3955163	96.99605269	96.5998528
200601A00009	6/1/2020	0.84	6/2/2025	6/1/2020	100.25731	97.90308451	95.61547534	93.39223383	91.23119907	89.13029553	87.08752906	85.10098326	83.16881593
200604A00001	6/4/2020	0.65	6/5/2023	6/4/2020	99.878531	99.44771694	99.02061105	98.59716529	98.17733275	97.76106731	97.34832361	96.9390571	96.53322394
200604A00004	6/4/2020	0.76	6/4/2024	6/4/2020	99.558771	98.16532162	96.79793584	95.45594696	94.13871069	92.84560406	91.57602453	90.32938915	89.10513379
200604A00005	6/4/2020	0.89	6/4/2025	6/4/2020	100.38218	98.02130432	95.72736503	93.49809778	91.33132684	89.22496261	87.17699766	85.18550297	83.2486244
200604A00009	6/4/2020	0.7	6/4/2025	6/4/2020	100.4239	98.0519142	95.74737742	93.5080034	91.33159391	89.21603804	87.15930809	85.15945585	83.21460893
200604A00010	6/4/2020	0.89	6/4/2025	6/4/2020	100.38218	98.02130432	95.72736503	93.49809778	91.33132684	89.22496261	87.17699766	85.18550297	83.2486244
200604A00012	6/4/2020	1.59	6/4/2030	6/4/2020	106.57193	99.3777726	92.71743891	86.54864663	80.83266151	75.53398335	70.62006104	66.06103413	61.82949808
200604A00013	6/4/2020	2.21	6/4/2035	6/4/2020	114.06079	102.1708721	91.65950823	82.35853498	74.12111993	66.81896209	60.33987037	54.58566885	49.47038331
200604A00014	6/4/2020	2.42	6/4/2040	6/4/2020	114.70195	99.01605946	85.76009493	74.53939613	65.02547135	56.94460731	50.06848748	44.2064559	39.19913155
200605A00007	6/5/2020	0.52	6/5/2023	6/5/2020	99.899093	99.46732805	99.0392901	98.61493119	98.19420398	97.77706191	97.36345922	96.95335094	96.54669285
200611A00010	6/11/2020	1.08	6/11/2027	6/11/2020	102.9862	98.65644069	94.53159404	90.60094073	86.85437567	83.28237039	79.87593715	76.62659554	73.52634122
200611A00011	6/11/2020	1.2	6/9/2028	6/11/2020	104.06161	98.76907052	93.77530843	89.06198387	84.61197314	80.40928114	76.4389614	72.68704231	69.14045882
200611A00013	6/11/2020	0.59	6/12/2023	6/11/2020	99.836602	99.38696522	98.94137404	98.49977354	98.06211019	97.62833143	97.19838564	96.77222209	96.34979096
200615A00005	6/15/2020	0.61	6/15/2023	6/15/2020	99.840915	99.38313507	98.92954794	98.48009601	98.03472282	97.59337296	97.15599201	96.72252653	96.29292404
200615A00019	6/17/2020	1.34	6/16/2025	6/17/2020	101.51291	99.10723306	96.77053957	94.50046009	92.2947257	90.15115854	88.06766757	86.04224454	84.07296016
200626A00014	6/26/2020	0.62	6/26/2025	6/26/2020	100.26256	97.83598787	95.48004394	93.1922687	90.9703079	88.81190318	86.71488746	84.67718071	82.69678585
200626A00015	6/26/2020	0.43	6/26/2023	6/26/2020	99.826568	99.33793091	98.85406233	98.37489299	97.9003547	97.43038054	96.9649049	96.50386342	96.04719297
200630A00004	6/30/2020	0.66	7/1/2024	6/30/2020	99.423979	97.96202847	96.52872245	95.12329423	93.7450039	92.39313722	91.06700445	89.7659394	88.48929833
200709A00002	7/10/2020	1.66	7/10/2025	7/10/2020	102.39957	99.91976827	97.51256401	95.17541252	92.90587205	90.7016015	88.5603556	86.47998033	84.45840857
200709A00003	7/10/2020	1.63	7/10/2026	7/10/2020	103.88976	100.4235843	97.09142341	93.8873833	90.80586057	87.84152812	84.9893199	82.24441656	79.60223205
200709A00004	7/10/2020	1.4	7/10/2025	7/10/2020	101.74114	99.26976802	96.87080956	94.54172152	92.28006767	90.08351225	87.9498151	85.87682711	83.86248589
200709A00005	7/10/2020	2.23	7/10/2030	7/10/2020	111.39139	103.9331084	97.03095467	90.64052034	84.72115654	79.23564115	74.14987367	69.43259864	65.05515492
200709A00006	7/10/2020	2.58	7/10/2030	7/10/2020	114.00337	106.4495396	99.45689912	92.98071763	86.98004988	81.41739831	76.25840624	71.47157981	67.02803592

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200709A00007	7/10/2020	1.67	7/9/2027	7/10/2020	105.72118	101.2581015	97.00866002	92.96153033	89.10604378	85.43214967	81.93037621	78.59179411	75.40798266
200709A00008	7/10/2020	1.88	7/10/2026	7/10/2020	104.77164	101.2899122	97.94264305	94.72391809	91.62811869	88.64990312	85.78419133	83.0261506	80.37118205
200709A00014	7/13/2020	0.57	1/20/2023	7/13/2020	100.01986	99.96164435	99.90351162	99.84546165	99.78749427	99.72960931	99.67180658	99.61408591	99.55644713
200710A00006	7/10/2020	0.4	7/10/2023	7/10/2020	99.78118	99.2547991	98.73395864	98.21857103	97.70855087	97.20381455	96.70428017	96.20986753	95.72049808
200716A00015	7/20/2020	1.54	7/19/2024	7/20/2020	100.81683	99.29529574	97.80406106	96.34229421	94.90918977	93.50397126	92.12588992	90.77422335	89.44827446
200720A00012	7/20/2020	0.77	7/15/2025	7/20/2020	100.15547	97.69110197	95.29935194	92.97765979	90.72356998	88.53472884	86.40887958	84.34385768	82.33758647
200720A00034	7/20/2020	0.77	7/21/2025	7/20/2020	100.1672	97.68670625	95.27963749	92.94338608	90.6754569	88.473459	86.33510053	84.25818393	82.24060136
200720A00035	7/20/2020	1.81	7/20/2035	7/20/2020	109.18504	97.48184049	87.15739207	78.04139167	69.98537839	62.85983666	56.55169495	50.96216545	46.00487675
200720A00037	7/22/2020	2.1	7/21/2025	7/22/2020	103.57525	101.0506053	98.60037893	96.22193173	93.91273926	91.67038239	89.49254216	87.37699491	85.32160772
200720A00039	7/22/2020	2.48	7/21/2025	7/22/2020	104.54897	102.0117193	99.5491622	97.15865906	94.83767708	92.58378908	90.39466834	88.26808376	86.20189525
200720A00042	7/22/2020	2.04	7/21/2026	7/22/2020	105.40282	101.8802037	98.49439299	95.23933664	92.10928326	89.09876713	86.20259231	83.41581765	80.73374287
200720A00044	7/22/2020	2.22	7/21/2026	7/22/2020	106.04317	102.5091702	99.11230101	95.84649812	92.70599884	89.68532666	86.77927524	83.98289356	81.29147183
200722A00010	7/22/2020	0.66	7/22/2024	7/22/2020	99.446627	97.92812526	96.43998124	94.98135321	93.55143061	92.14943219	90.77460471	89.42622163	88.10358194
200722A00011	7/22/2020	0.59	7/24/2023	7/22/2020	99.74422	99.18154571	98.62519378	98.07505776	97.53103399	96.99302106	96.46091983	95.9346333	95.41406659
200722A00012	7/22/2020	0.41	7/21/2023	7/22/2020	99.760524	99.20451452	98.6546839	98.11092949	97.57315093	97.04125005	96.51513082	95.9946993	95.47986359
200727A00016	7/27/2020	0.43	7/27/2023	7/27/2020	99.757944	99.18575748	98.62010552	98.06087678	97.50796239	96.96125593	96.42065334	95.8860529	95.35735513
200730A00001	7/30/2020	0.46	7/30/2024	7/30/2020	99.447844	97.90257867	96.38852791	94.90481369	93.45059099	92.02504595	90.62739433	89.25688025	87.9127748
200730A00002	7/30/2020	0.67	11/6/2024	7/30/2020	99.580277	97.78090147	96.02236485	94.3035075	92.62320974	90.98039044	89.37400542	87.80304599	86.2665375
200731A00004	7/31/2020	0.38	7/31/2023	7/31/2020	99.718814	99.13598238	98.55992887	97.99053547	97.42768732	96.87127217	96.32118033	95.77730458	95.23954013
200731A00005	7/31/2020	0.45	7/31/2024	7/31/2020	99.43276	97.88501906	96.36857596	94.88254927	93.42609049	91.99838244	90.59863776	89.22609759	87.88003023
200803A00005	8/3/2020	0.54	6/30/2023	8/3/2020	99.776805	99.27864169	98.78542442	98.2970803	97.81353755	97.33472577	96.86057595	96.3910204	95.92599275
200803A00011	8/3/2020	0.72	8/4/2025	8/3/2020	100.06281	97.54690013	95.10626192	92.73818889	90.44009323	88.20949681	86.04402575	83.94140525	81.89945478
200806A00002	8/6/2020	0.43	8/6/2024	8/6/2020	99.405611	97.84249786	96.31119547	94.81080029	93.34044249	91.89928468	90.4865204	89.10137265	87.74309256
200810A00004	8/10/2020	0.43	8/9/2024	8/10/2020	99.407999	97.83706822	96.29820961	94.79050759	93.31308152	91.86508377	90.4456982	89.05413862	87.68964744
200811A00003	8/11/2020	0.57	8/11/2025	8/11/2020	100.22246	97.67460316	95.20360201	92.80666942	90.48114102	88.22446658	86.03420424	83.90801508	81.84365804
200812A00004	8/12/2020	0.59	8/12/2025	8/12/2020	100.27668	97.7255214	95.25136632	92.85142523	90.52302633	88.26361241	86.07073504	83.94204909	81.87530766
200814A00009	8/18/2020	1.36	8/16/2028	8/18/2020	104.95034	99.46006964	94.28845945	89.41539718	84.82214157	80.49122326	76.40635176	72.55232983	68.91497444
200814A00011	8/18/2020	1.58	8/16/2030	8/18/2020	106.59512	99.22051336	92.40600124	86.10619872	80.27961942	74.88832084	69.89758463	65.27562722	60.99333783
200818A00004	8/18/2020	0.92	8/18/2026	8/18/2020	101.49684	97.97106794	94.58526499	91.33311532	88.20862362	85.20609876	82.32013646	79.545603	76.87762
200818A00005	8/18/2020	1.05	8/18/2027	8/18/2020	102.96657	98.46259244	94.17926835	90.10464848	86.22749459	82.53723392	79.02391604	75.67817272	72.49118061
200818A00006	8/18/2020	1.18	8/18/2028	8/18/2020	103.93836	98.47108542	93.32186149	88.47058596	83.89852635	79.58822304	75.52339621	71.6888599	68.07044297
200818A00007	8/18/2020	1.31	8/20/2029	8/18/2020	104.47381	98.06704963	92.09142168	86.51575799	81.31130057	76.45150025	71.91183605	67.66965017	63.7039973
200818A00008	8/18/2020	1.5	8/18/2031	8/18/2020	106.45963	98.19472563	90.63108583	83.70563365	77.36126277	71.54624777	66.21371199	61.32115051	56.83000222

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200818A00009	8/18/2020	1.7	8/18/2033	8/18/2020	108.6647	98.56761717	89.49859237	81.34739896	74.0161525	67.4178715	61.47521358	56.11936385	51.28905638
200818A00010	8/18/2020	1.88	8/20/2035	8/18/2020	109.99631	98.17694605	87.75634904	78.5608883	70.43931454	63.25977736	56.90725089	51.28131203	46.29422172
200819A00007	8/19/2020	0.38	8/21/2023	8/19/2020	99.659143	99.02018582	98.38938707	97.76659157	97.15164772	96.54440772	95.94472748	95.35246647	94.76748764
200825A00007	8/27/2020	4.79	8/27/2026	8/27/2020	115.67903	111.8712144	108.2125613	104.6963652	101.3162604	98.06620463	94.94046003	91.93357627	89.04037415
200826A00040	8/28/2020	0.92	10/27/2023	8/28/2020	99.781126	98.96505015	98.16224536	97.37238993	96.59517281	95.83029282	95.07745828	94.33638664	93.60680412
200827A00007	8/27/2020	0.77	8/27/2025	8/27/2020	100.22989	97.65273999	95.15403332	92.73090003	90.38059239	88.10048198	85.88805359	83.74089945	81.65671383
200828A00002	8/28/2020	0.73	8/28/2026	8/28/2020	101.5939	98.02032081	94.58990961	91.29614821	88.13285243	85.09415492	82.17448693	79.36856114	76.67135564
200911A00006	9/11/2020	0.37	9/11/2023	9/11/2020	99.59517	98.90029065	98.21506147	97.53928287	96.87276032	96.21530463	95.56673172	94.92686249	94.29552261
200922A00027	9/24/2020	1.65	9/23/2025	9/24/2020	102.68108	100.0009911	97.4039941	94.88697953	92.4469752	90.08114158	87.78676481	85.56125002	83.4021152
200922A00029	9/24/2020	2.73	9/25/2023	9/24/2020	101.1767	100.4397757	99.71356813	98.997848	98.29238928	97.5969724	96.91138402	96.23541681	95.56886921
200922A00030	9/24/2020	2.45	9/25/2023	9/24/2020	100.96834	100.2322717	99.50691184	98.79203072	98.08740248	97.3928077	96.70803319	96.03287173	95.36712193
200922A00033	9/24/2020	2.37	9/23/2024	9/24/2020	102.48397	100.7747509	99.10203127	97.464707	95.86171808	94.29204718	92.75471748	91.24879053	89.77336441
200922A00034	9/24/2020	2.24	9/23/2026	9/24/2020	106.51907	102.8077827	99.24604075	95.82695855	92.5440151	89.39102823	86.36213458	83.45177111	80.6546576
200922A00035	9/24/2020	2.94	9/23/2024	9/24/2020	103.47639	101.7582694	100.0768143	98.43091194	96.8194981	95.24155125	93.69609054	92.18217366	90.69889496
200922A00036	9/24/2020	1.55	9/23/2025	9/24/2020	102.40739	99.73107108	97.1377628	94.62435103	92.1878663	89.8254717	87.53445584	85.31222626	83.15630325
200922A00037	9/24/2020	2.76	9/23/2025	9/24/2020	105.71912	102.997103	100.3591615	97.80215592	95.32308395	92.91907731	90.58739441	88.3254138	86.13062786
200922A00038	9/24/2020	2.33	9/25/2023	9/24/2020	100.87905	100.1433415	99.41834486	98.70382331	97.99955099	97.30530855	96.62088283	95.9460667	95.28065881
200922A00039	9/24/2020	3	9/23/2025	9/24/2020	106.376	103.644911	100.9981167	98.43246433	95.94494531	93.53268503	91.19293594	88.92307083	86.72057654
200922A00040	9/24/2020	2	9/23/2024	9/24/2020	101.83977	100.1363266	98.4692774	96.83752134	95.24000122	93.67570244	92.14365076	90.64291025	89.17258142
200922A00041	9/24/2020	2.68	9/23/2024	9/24/2020	103.02371	101.3096469	99.63217641	97.99018688	96.38261599	94.80844413	93.2666923	91.75641995	90.27672313
200922A00043	9/24/2020	2.4	9/25/2023	9/24/2020	100.93114	100.1952174	99.47000893	98.75527763	98.05079769	97.35634972	96.67172054	95.99670297	95.33109563
200922A00044	9/24/2020	2.61	9/25/2023	9/24/2020	101.08741	100.3508454	99.62500115	98.90964059	98.20453779	97.50947325	96.82423366	96.14861177	95.48240609
200925A00002	9/25/2020	0.74	9/25/2025	9/25/2020	100.19342	97.54255295	94.97425967	92.4854418	90.07313654	87.73451373	85.46686879	83.26761611	81.13428282
200925A00003	9/25/2020	0.59	9/25/2024	9/25/2020	99.369413	97.68326779	96.03329643	94.41839985	92.83752388	91.28965695	89.77382788	88.28910381	86.83458829
200925A00004	9/25/2020	0.53	9/25/2023	9/25/2020	99.539585	98.80938733	98.08984012	97.3807122	96.6817787	95.99282119	95.31362744	94.64399121	93.983712
200925A00008	9/25/2020	0.74	9/25/2025	9/25/2020	100.19342	97.54255295	94.97425967	92.4854418	90.07313654	87.73451373	85.46686879	83.26761611	81.13428282
200928A00002	9/28/2020	0.35	9/28/2023	9/28/2020	99.53525	98.79526271	98.06620775	97.34784433	96.63993889	95.94226459	95.25460113	94.57673448	93.90845666
200928A00003	9/28/2020	0.55	9/26/2025	9/28/2020	100.24138	97.57452712	94.99107267	92.48786825	90.06191161	87.71033543	85.43040009	83.2194869	81.07509178
201006A00007	10/8/2020	1.47	10/10/2023	10/8/2020	100.23397	99.4610554	98.70001399	97.95057639	97.21247872	96.48546508	95.76928719	95.06370415	94.36848218
201022A00012	10/26/2020	2.25	10/24/2030	10/26/2020	111.87815	104.1343795	96.98700504	90.38695343	84.28942142	78.6534879	73.44175951	68.62005022	64.15709144
201028A00003	10/30/2020	1.42	2/27/2026	10/30/2020	102.62347	99.52810457	96.54156693	93.65939949	90.87735671	88.19139314	85.59765249	83.09245751	80.67230042
201028A00004	10/30/2020	1.55	12/29/2023	10/30/2020	100.36673	99.3809546	98.41444111	97.46663086	96.53698542	95.62498685	94.73013669	93.85195513	92.98998008
201028A00005	10/30/2020	1.85	10/31/2025	10/30/2020	103.40878	100.6171254	97.91487119	95.29869763	92.76542336	90.31200159	87.9355136	85.63316264	83.40226822

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
201028A00006	10/30/2020	1.56	2/15/2024	10/30/2020	100.42329	99.31091158	98.22304704	97.15889655	96.11769143	95.09869589	94.1012053	93.12454456	92.16806658
201030A00001	11/2/2020	2.54	10/29/2040	11/2/2020	116.388	100.2949224	86.73634906	75.29332913	65.61840437	57.42308726	50.46758415	44.55235178	39.5111532
201030A00002	11/2/2020	2.8	10/29/2040	11/2/2020	120.67088	104.2279465	90.35896116	78.6398622	68.71880087	60.30351248	53.15094822	47.05875484	41.85826535
201030A00003	11/2/2020	2.58	10/29/2040	11/2/2020	117.0469	100.900003	87.29367399	75.80818037	66.09538844	57.8662296	50.88040939	44.93795225	39.87224737
201030A00004	11/2/2020	2.56	10/29/2040	11/2/2020	116.71745	100.5974627	87.01501153	75.55075475	65.8568964	57.64465843	50.67399677	44.74515201	39.69170028
201030A00005	11/2/2020	2.49	10/29/2040	11/2/2020	115.56437	99.53857157	86.03969288	74.64976508	65.02217427	56.86915934	49.95155259	44.07035119	39.05978547
201116A00010	11/16/2020	0.57	11/15/2023	11/16/2020	99.452172	98.58737085	97.7375151	96.90222007	96.08111425	95.27383862	94.48004624	93.69940163	92.93158042
201116A00011	11/16/2020	0.71	11/15/2024	11/16/2020	99.665361	97.84202976	96.06056498	94.31976354	92.6184644	90.955547	89.32992959	87.74056767	86.18645242
201204A00016	12/8/2020	1.58	12/8/2023	12/8/2020	100.36587	99.43573964	98.52277715	97.62650739	96.74647584	95.88224434	95.03339039	94.19950641	93.38019913
201208A00029	12/10/2020	1.52	12/9/2025	12/10/2020	102.61309	99.73146941	96.94540271	94.25121433	91.64539004	89.12456971	86.68553964	84.32522531	82.04068456
201208A00031	12/10/2020	1.43	12/9/2024	12/10/2020	101.08171	99.18221433	97.32766122	95.51671864	93.74810182	92.02057242	90.33293645	88.68404244	87.07277957
210106A00006	1/8/2021	0.48	7/17/2023	1/8/2021	99.700438	99.15673276	98.61893874	98.08695984	97.56070211	97.04007356	96.52498421	96.01534596	95.5110726
210106A00007	1/8/2021	0.49	7/25/2023	1/8/2021	99.684487	99.11931935	98.56053116	98.00801496	97.46166569	96.9213806	96.38705923	95.85860331	95.33591674
210114A00009	1/19/2021	2.66	1/17/2030	1/19/2021	113.8969	106.7972849	100.1950698	94.05273055	88.33575826	83.01240502	78.0534493	73.43198281	69.12321615
210125A00006	1/27/2021	2.16	1/26/2027	1/27/2021	106.98149	102.9289801	99.05292103	95.34468878	91.79612891	88.3995279	85.1475868	82.03339661	79.05041521
210125A00007	1/27/2021	2.98	1/27/2031	1/27/2021	118.0133	109.7922347	102.2176723	95.23511688	88.79493986	82.85192163	77.36483864	72.29609115	67.61136739
210128A00008	1/28/2021	0.54	4/9/2024	1/28/2021	99.23078	97.98535862	96.76740526	95.57601159	94.41030963	93.26946923	92.15269599	91.05922935	89.98834079
210128A00010	1/28/2021	0.57	7/9/2024	1/28/2021	99.294601	97.81219924	96.35906814	94.93441316	93.53746826	92.16749446	90.82377856	89.50563206	88.21239006
210129A00008	1/29/2021	0.62	10/8/2024	1/29/2021	99.453225	97.73177491	96.04789057	94.40045031	92.78837623	91.21063243	89.66622292	88.15418968	86.67361084
210129A00013	1/29/2021	0.65	1/9/2025	1/29/2021	99.597349	97.63130107	95.71357007	93.8426632	92.01714471	90.23563306	88.4967985	86.79936069	85.14208651
210201A00004	2/3/2021	1.15	2/3/2025	2/3/2021	100.68088	98.63797547	96.64628631	94.70418405	92.81010677	90.96255366	89.16008212	87.40130499	85.68488801
210201A00012	2/3/2021	0.75	11/17/2025	2/3/2021	100.30921	97.51850991	94.81886468	92.20683439	89.67912777	87.23259499	84.86422079	82.57111797	80.35052126
210209A00029	2/12/2021	0.8	12/15/2025	2/12/2021	100.50255	97.63643254	94.86613954	92.18795704	89.59833819	87.09389264	84.67137875	82.32769615	80.05987883
210210A00005	2/10/2021	0.52	2/13/2024	2/10/2021	99.255244	98.15497098	97.07888432	96.02619412	94.99614465	93.98801242	93.00110446	92.03475671	91.08833258
210212A00008	2/12/2021	0.95	10/13/2026	2/12/2021	101.76284	98.08781034	94.56377467	91.18373027	87.94103748	84.8294005	81.84284753	78.97571206	76.22261551
210212A00014	2/17/2021	1.38	2/17/2026	2/17/2021	102.45515	99.39006183	96.432003	93.57661847	90.81976218	88.15748173	85.58600798	83.10174527	80.70126231
210212A00016	2/17/2021	1.32	2/18/2025	2/17/2021	101.09282	99.00391658	96.96810169	94.98366496	93.04896043	91.16240794	89.32248993	87.52774841	85.7767821
210216A00006	2/16/2021	1.44	2/15/2030	2/16/2021	106.95491	99.95343971	93.45457058	87.41969262	81.81335203	76.60297653	71.7586271	67.25277231	63.06008307
210216A00007	2/16/2021	1.3	2/16/2029	2/16/2021	105.88807	99.85142742	94.19404724	88.89018904	83.91599115	79.24932188	74.86964524	70.75789781	66.8963757
210216A00008	2/16/2021	0.71	2/17/2026	2/16/2021	101.00589	97.94777239	94.99698873	92.14915862	89.40010914	86.7458629	84.1826276	81.70678604	79.31488694
210216A00009	2/16/2021	0.92	2/16/2027	2/16/2021	102.86543	98.81433359	94.94336563	91.24356859	87.7064779	84.32409498	81.08885877	77.99361923	75.03161255
210226A00012	2/26/2021	2.31	2/26/2036	2/26/2021	115.16761	102.6177293	91.59463971	81.90298217	73.37337084	65.85881883	59.23167458	53.38099037	48.21026054
210304A00004	3/4/2021	0.58	3/4/2024	3/4/2021	99.28565	98.13312416	97.00711502	95.90671652	94.83106391	93.77933094	92.75072777	91.74449897	90.75992165

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210305A00013	3/5/2021	2.41	3/5/2036	3/5/2021	116.43284	103.7865122	92.67817191	82.9109413	74.31413237	66.73964611	60.05887973	54.16007077	48.94601466
210312A00004	3/12/2021	0.34	3/10/2023	3/12/2021	99.95978	99.76617639	99.57333498	99.38125143	99.18992122	98.99933983	98.80950281	98.62040572	98.43204416
210312A00005	3/12/2021	0.53	3/12/2024	3/12/2021	99.452178	98.27411636	97.1237052	95.99998174	94.90202696	93.8289636	92.77995382	91.75419696	90.75092754
210312A00010	3/12/2021	0.63	3/12/2024	3/12/2021	99.337656	98.16391536	97.01767003	95.89796363	94.80388384	93.73455974	92.68915947	91.66688803	90.6669853
210323A00007	3/23/2021	0.51	3/25/2024	3/23/2021	99.418922	98.20699236	97.02431927	95.86985499	94.74260135	93.64160672	92.56596339	91.514805	90.48730424
210414A00001	4/14/2021	0.7	5/16/2024	4/14/2021	99.462923	98.12039635	96.80214894	95.50757977	94.23610742	92.98716904	91.76021958	90.55473115	89.37019234
210428A00006	4/28/2021	1.23	4/28/2026	4/28/2021	102.22439	98.97808984	95.85107888	92.83837347	89.93522277	87.13709811	84.4396814	81.8388542	79.33068748
210428A00007	4/28/2021	1.74	10/27/2028	4/28/2021	107.14855	101.4125884	96.01870269	90.9447919	86.17028781	81.67604281	77.44422506	73.45822181	69.70255033
210428A00008	4/28/2021	1.93	4/26/2030	4/28/2021	108.99376	101.8101682	95.15064042	88.9742803	83.24357311	77.9240942	72.98424019	68.39498476	64.12965674
210428A00015	4/28/2021	2.02	4/28/2031	4/28/2021	110.59893	102.4381276	94.94367831	88.05768882	81.7275678	75.90551733	70.54807422	65.61569738	61.0723962
210429A00005	4/29/2021	2.08	4/29/2031	4/29/2021	111.09525	102.9120088	95.39667784	88.49123199	82.1429641	76.30397049	70.93069146	65.9834978	61.42631847
210507A00008	5/7/2021	1.94	5/7/2031	5/7/2021	109.9626	101.8050843	94.31608894	87.43734983	81.11595801	75.30383973	69.95729281	65.03656948	60.5055008
210507A00009	5/7/2021	2.02	5/7/2032	5/7/2021	111.48546	102.3660909	94.07160313	86.52294399	79.64901205	73.38581966	67.67574932	62.46689108	57.71245174
210514A00033	5/18/2021	2.8	5/18/2028	5/18/2021	112.65704	107.1927366	102.0300339	97.15072219	92.53778071	88.17529481	84.04837851	80.14310309	76.44643092
210527A00008	5/27/2021	0.32	5/30/2023	5/27/2021	99.823378	99.40812607	98.99631424	98.58789955	98.18284016	97.78109491	97.38262332	96.98738554	96.5953424
210527A00009	5/27/2021	0.5	5/28/2024	5/27/2021	99.462528	98.08350817	96.73002677	95.40143726	94.09711448	92.81645375	91.55887007	90.32379727	89.11068731
210527A00019	5/27/2021	1	5/27/2026	5/27/2021	102.25866	98.9168507	95.70097793	92.60565229	89.62574598	86.75637637	83.9928929	81.33086482	78.76606958
210527A00026	6/1/2021	2.78	6/1/2028	6/1/2021	112.61309	107.1123119	101.9171933	97.00915393	92.37083791	87.98602463	83.83954897	79.91722738	76.20578967
210528A00003	5/28/2021	0.63	5/28/2024	5/28/2021	99.37007	97.99622375	96.64775535	95.32402379	94.02440918	92.74831189	91.49515166	90.26436691	89.05541393
210601A00002	6/1/2021	0.9	6/2/2025	6/1/2021	100.40304	98.04701878	95.75765557	93.53269775	91.36998331	89.26743563	87.22305952	85.23493757	83.30122662
210603A00015	6/7/2021	2.71	6/7/2028	6/7/2021	112.25741	106.7504925	101.5505783	96.63895463	91.99813878	87.61179519	83.46465444	79.54243847	75.83179135
210607A00001	6/7/2021	0.46	6/7/2023	6/7/2021	99.787552	99.35160149	98.91945215	98.49105467	98.06636031	97.64532115	97.22789013	96.81402095	96.40366815
210608A00005	6/8/2021	0.51	6/7/2024	6/8/2021	99.481241	98.07604374	96.69734106	95.34445064	94.01671277	92.71348978	91.43416509	90.17814238	88.94484471
210608A00017	6/10/2021	2.67	6/8/2029	6/10/2021	113.23508	106.7337041	100.6530319	94.96361845	89.63822661	84.65164865	79.98054537	75.60329868	71.49987648
210609A00007	6/11/2021	2.6	6/11/2029	6/11/2021	112.79386	106.2987518	100.2246923	94.54216893	89.22388433	84.24457802	79.58086453	75.21108529	71.11517286
210609A00011	6/11/2021	1.32	6/11/2024	6/11/2021	100.37864	98.96095986	97.57011553	96.20541649	94.8661912	93.55179065	92.2615874	90.99497468	89.75136556
210609A00013	6/11/2021	1.64	6/11/2025	6/11/2021	102.23419	99.83240935	97.49907508	95.23185603	93.02851299	90.88689607	88.80494059	86.78066315	84.81215792
210621A00008	6/21/2021	1.04	6/23/2025	6/21/2021	100.78768	98.37315368	96.02842211	93.75107837	91.53880942	89.38939578	87.30070716	85.27069826	83.29740485
210623A00011	6/23/2021	0.56	6/23/2023	6/23/2021	99.799179	99.31989865	98.84520829	98.37504225	97.90933609	97.44802656	96.99105162	96.53835039	96.08986312
210624A00020	6/24/2021	0.78	6/24/2024	6/24/2021	99.600163	98.15494344	96.73772319	95.3477615	93.98434305	92.64677705	91.33439615	90.04655546	88.78263165
210624A00022	6/24/2021	0.87	6/24/2025	6/24/2021	100.88334	98.4540669	96.09530016	93.80459085	91.5795942	89.41806067	87.31783148	85.27683435	83.29307944
210709A00002	7/9/2021	1.36	7/9/2029	7/9/2021	106.26304	99.84719012	93.85753075	88.26362312	83.03735195	78.15273525	73.58575211	69.31418525	65.31747701
210715A00009	7/15/2021	0.54	7/17/2023	7/15/2021	99.733509	99.1896987	98.65180073	98.11971869	97.59335861	97.0726285	96.55743836	96.0477001	95.54332747

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
210720A00035	7/22/2021	2.27	7/21/2031	7/22/2021	112.92831	104.4635778	96.7049178	89.58958935	83.06073157	77.06678616	71.56097803	66.5008492	61.84784022
210722A00001	7/22/2021	1.1	7/22/2026	7/22/2021	102.06229	98.59638565	95.26578712	92.0644874	88.98678314	86.02725479	83.18075083	80.44237288	77.80746177
210802A00002	8/2/2021	0.7	8/1/2025	8/2/2021	100.54412	98.01791679	95.56729933	93.18955545	90.88208669	88.64240468	86.46812568	84.35696541	82.30673417
210804A00008	8/6/2021	2.28	8/4/2028	8/6/2021	110.08788	104.4864911	99.20627407	94.22712754	89.53031177	85.09834959	80.91493478	76.96484752	73.23387648
210816A00003	8/16/2021	0.71	8/16/2024	8/16/2021	99.552306	97.96747919	96.41515895	94.89440998	93.40433301	91.9440628	90.51276652	89.10964221	87.73391733
210817A00013	8/19/2021	2	8/19/2026	8/19/2021	105.42703	101.8273278	98.36984916	95.04818451	91.85625398	88.78828595	85.83879946	83.0025877	80.27470259
210818A00005	8/18/2021	0.6	8/19/2024	8/18/2021	99.696161	98.09679096	96.53041386	94.99607439	93.49285431	92.01987042	90.57627282	89.16124339	87.77399423
210818A00007	8/18/2021	0.81	8/18/2025	8/18/2021	100.86897	98.29436667	95.79777835	93.37635964	91.0273915	88.74827219	86.53651134	84.38972426	82.30562671
210830A00011	8/30/2021	0.53	8/30/2023	8/30/2021	99.609673	98.94838661	98.29582564	97.65181823	97.01619733	96.38880022	95.76946836	95.15804725	94.55438633
210901A00012	9/1/2021	0.51	9/1/2023	9/1/2021	99.590716	98.92417298	98.26649967	97.61751997	96.97706259	96.34496071	95.72105183	95.10517766	94.49718393
210903A00002	9/8/2021	1.22	9/8/2023	9/8/2021	100.06656	99.37952767	98.70189544	98.03347091	97.37406737	96.72350309	96.08160123	95.44818963	94.82310066
210916A00007	9/16/2021	0.75	9/16/2024	9/16/2021	99.637947	97.9725953	96.34259533	94.74688593	93.18444855	91.65430523	90.15551651	88.68717954	87.2484262
210917A00008	9/17/2021	1.55	9/15/2028	9/17/2021	106.02934	100.4334049	95.16575846	90.20543873	85.5329369	81.13008441	76.97995356	73.06676613	69.37580919
210924A00003	9/24/2021	2.37	9/24/2036	9/24/2021	115.83124	102.7795216	91.37431013	81.39721811	72.65992542	64.99990312	58.27676325	52.36914123	47.17203081
210924A00004	9/24/2021	2.37	9/24/2036	9/24/2021	115.83124	102.7795216	91.37431013	81.39721811	72.65992542	64.99990312	58.27676325	52.36914123	47.17203081
210924A00005	9/24/2021	2.37	9/24/2036	9/24/2021	115.83124	102.7795216	91.37431013	81.39721811	72.65992542	64.99990312	58.27676325	52.36914123	47.17203081
210924A00011	9/24/2021	2.19	9/25/2034	9/24/2021	113.88881	102.5838626	92.52518728	83.56800211	75.58506043	68.46444424	62.10764711	56.42790532	51.34874423
211001A00001	10/1/2021	0.59	10/2/2023	10/1/2021	99.567371	98.81846157	98.08074691	97.35397807	96.63791311	95.93231721	95.23696233	94.55162704	93.87609623
211005A00019	10/5/2021	0.47	10/5/2023	10/5/2021	99.61125	98.85229505	98.10483713	97.36861636	96.64338097	95.92888667	95.22489637	94.5311799	93.84751379
211015A00028	10/15/2021	0.73	10/16/2023	10/15/2021	99.650092	98.86367067	98.08959628	97.32757987	96.57734146	95.83860969	95.11112147	94.39462168	93.68886286
211022A00008	10/22/2021	1.12	10/22/2024	10/22/2021	100.38084	98.61333594	96.88512638	95.19507958	93.54210767	91.92516183	90.34323051	88.79533784	87.28054208
211103A00007	11/3/2021	0.52	1/4/2023	11/3/2021	100.00377	99.98990364	99.97605525	99.96222042	99.94839913	99.93459135	99.92079708	99.90701627	99.89324892
211206A00010	12/6/2021	1.54	12/4/2026	12/6/2021	104.22434	100.3667004	96.67246245	93.13387352	89.74359174	86.4946593	83.3804803	80.39480006	77.53168564
211217A00021	12/21/2021	2.44	12/18/2026	12/21/2021	107.8564	103.8898658	100.0920862	96.45499719	92.97096531	89.63275999	86.43352994	83.36678127	80.42635693
211222A00003	12/22/2021	1.33	1/15/2025	12/22/2021	100.9998	99.00356123	97.05655191	95.15723929	93.30415191	91.49587436	89.73104469	88.008352	86.32653412
211222A00004	12/22/2021	1.26	10/15/2024	12/22/2021	100.61471	98.86381472	97.15146243	95.4765252	93.83791724	92.23459342	90.6655473	89.12980938	87.62644542
211222A00005	12/22/2021	1.2	7/15/2024	12/22/2021	100.27597	98.76958335	97.2930965	95.84568738	94.42656618	93.03497127	91.67016796	90.33144728	89.01812488
211222A00008	12/22/2021	1.13	4/15/2024	12/22/2021	100.00464	98.7387879	97.49915892	96.28493892	95.09535191	93.92965368	92.78713016	91.66709591	90.56889262
211222A00010	12/22/2021	1.06	1/16/2024	12/22/2021	99.869985	98.83952522	97.83019833	96.84135948	95.87239007	94.92269618	93.99170734	93.07887541	92.18367347
211222A00011	12/22/2021	0.97	10/16/2023	12/22/2021	99.842552	99.05528433	98.28037285	97.51752854	96.76647125	96.02692944	95.29863987	94.58134727	93.87480402
211222A00012	12/22/2021	0.88	7/17/2023	12/22/2021	99.920909	99.37650571	98.83801868	98.30535216	97.77841211	97.25710649	96.74134524	96.23104019	95.72610507
211222A00017	12/22/2021	0.88	7/17/2023	12/22/2021	99.920909	99.37650571	98.83801868	98.30535216	97.77841211	97.25710649	96.74134524	96.23104019	95.72610507
211222A00018	12/22/2021	0.88	7/17/2023	12/22/2021	99.920909	99.37650571	98.83801868	98.30535216	97.77841211	97.25710649	96.74134524	96.23104019	95.72610507

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
211222A00019	12/22/2021	0.97	10/16/2023	12/22/2021	99.842552	99.05528433	98.28037285	97.51752854	96.76647125	96.02692944	95.29863987	94.58134727	93.87480402
211222A00020	12/22/2021	0.97	10/16/2023	12/22/2021	99.842552	99.05528433	98.28037285	97.51752854	96.76647125	96.02692944	95.29863987	94.58134727	93.87480402
211222A00021	12/22/2021	1.06	1/16/2024	12/22/2021	99.869985	98.83952522	97.83019833	96.84135948	95.87239007	94.92269618	93.99170734	93.07887541	92.18367347
211222A00022	12/22/2021	1.06	1/16/2024	12/22/2021	99.869985	98.83952522	97.83019833	96.84135948	95.87239007	94.92269618	93.99170734	93.07887541	92.18367347
211222A00023	12/22/2021	1.13	4/15/2024	12/22/2021	100.00464	98.7387879	97.49915892	96.28493892	95.09535191	93.92965368	92.78713016	91.66709591	90.56889262
211222A00024	12/22/2021	1.13	4/15/2024	12/22/2021	100.00464	98.7387879	97.49915892	96.28493892	95.09535191	93.92965368	92.78713016	91.66709591	90.56889262
211222A00025	12/22/2021	1.2	7/15/2024	12/22/2021	100.27597	98.76958335	97.2930965	95.84568738	94.42656618	93.03497127	91.67016796	90.33144728	89.01812488
211222A00026	12/22/2021	1.2	7/15/2024	12/22/2021	100.27597	98.76958335	97.2930965	95.84568738	94.42656618	93.03497127	91.67016796	90.33144728	89.01812488
211222A00027	12/22/2021	1.26	10/15/2024	12/22/2021	100.61471	98.86381472	97.15146243	95.4765252	93.83791724	92.23459342	90.6655473	89.12980938	87.62644542
211222A00029	12/22/2021	1.26	10/15/2024	12/22/2021	100.61471	98.86381472	97.15146243	95.4765252	93.83791724	92.23459342	90.6655473	89.12980938	87.62644542
211222A00030	12/22/2021	1.33	1/15/2025	12/22/2021	100.9998	99.00356123	97.05655191	95.15723929	93.30415191	91.49587436	89.73104469	88.008352	86.32653412
211222A00031	12/22/2021	1.33	1/15/2025	12/22/2021	100.9998	99.00356123	97.05655191	95.15723929	93.30415191	91.49587436	89.73104469	88.008352	86.32653412
220106A00018	1/10/2022	3.11	1/8/2032	1/10/2022	120.91779	111.6825891	103.2462982	95.53508301	88.4823048	82.02778542	76.11715014	70.70124065	65.73559003
220106A00019	1/10/2022	3.17	1/7/2033	1/10/2022	123.14008	112.8715587	103.5752623	95.15312412	87.51746796	80.58985944	74.30008844	68.58526791	63.38903571
220112A00004	1/12/2022	1.55	1/12/2026	1/12/2022	103.47464	100.4752061	97.57817563	94.77948197	92.07524765	89.46177113	86.93551769	84.49311086	82.13132438
220112A00005	1/12/2022	1.55	1/12/2026	1/12/2022	103.47464	100.4752061	97.57817563	94.77948197	92.07524765	89.46177113	86.93551769	84.49311086	82.13132438
220118A00008	1/18/2022	1.36	1/18/2024	1/18/2022	100.18754	99.15003103	98.13389055	97.13846831	96.16313586	95.20728994	94.27035122	93.35176313	92.45099079
220118A00009	1/18/2022	1.65	1/17/2025	1/18/2022	101.66428	99.65586142	97.69701892	95.78620605	93.92193821	92.10278752	90.32738017	88.59439399	86.90255606
220125A00010	1/25/2022	1.89	1/25/2027	1/25/2022	105.87654	101.8490307	97.99705698	94.31203999	90.78586559	87.41085833	84.17975525	81.08568137	78.12212675
220217A00021	2/17/2022	1.85	2/13/2024	2/17/2022	100.75984	99.65053078	98.56554345	97.50408714	96.46540271	95.44876339	94.45347307	93.47886463	92.52429854
220225A00013	2/25/2022	1.92	2/23/2024	2/25/2022	100.86208	99.7258185	98.61504925	97.52892247	96.46662525	95.42738009	94.41044301	93.41510171	92.44067394
220302A00006	3/2/2022	1.52	4/25/2023	3/2/2022	100.20278	99.88302369	99.56530539	99.24960791	98.93591201	98.6241987	98.31444923	98.0066451	97.70076801
220310A00005	3/10/2022	2.06	3/8/2024	3/10/2022	101.05291	99.87876885	98.7318057	97.61108895	96.51572557	95.44486268	94.39768523	93.37341402	92.37130365
220317A00012	3/17/2022	1.99	9/15/2023	3/17/2022	100.61278	99.90489559	99.20695409	98.51874512	97.84006603	97.17071975	96.51051464	95.85926425	95.21678721
220322A00010	3/22/2022	2.34	9/22/2023	3/22/2022	100.87962	100.1519348	99.43473236	98.72778409	98.0308711	97.34378075	96.66630638	95.99824708	95.33940751
220323A00008	3/23/2022	2.47	3/25/2024	3/23/2022	101.62604	100.4032015	99.20971926	98.04454203	96.90667174	95.7951568	94.70908937	93.64760289	92.60986975
220401A00009	4/1/2022	2.98	4/1/2027	4/1/2022	110.8725	106.5600612	102.4413598	98.50660711	94.74656378	91.15250901	87.71620827	84.42988317	81.28618326
220406A00006	4/6/2022	2.65	10/6/2023	4/6/2022	101.15422	100.3879304	99.63323588	98.88987231	98.15758587	97.43613021	96.72526629	96.02476203	95.3343921
220406A00007	4/6/2022	2.87	4/8/2024	4/6/2022	102.21647	100.9534528	99.71846823	98.5105802	97.32889603	96.17256227	95.04076249	93.9327153	92.84767247
220421A00013	4/21/2022	3.33	9/15/2026	4/21/2022	110.51316	106.7488745	103.1347365	99.66389111	96.32983796	93.12641202	90.04776394	87.08834178	84.24287394
220421A00015	4/21/2022	3.12	9/16/2024	4/21/2022	103.71862	102.0170609	100.3515087	98.720885	97.12415389	95.5603205	94.02842914	92.52756132	91.05683386
220429A00002	4/29/2022	3.63	4/29/2032	4/29/2022	126.2502	116.4876823	107.5888332	99.47192802	92.06338742	85.29693002	79.11281425	73.45716258	68.28135852
220429A00006	4/29/2022	3.06	4/29/2024	4/29/2022	102.62675	101.3070713	100.0108218	98.73742743	97.48632999	96.25698911	95.04888152	93.86150045	92.69435494

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220429A00007	4/29/2022	3.14	10/29/2024	4/29/2022	104.11476	102.2932504	100.5124836	98.77131072	97.06862265	95.40334826	93.774453	92.18093736	90.62183546
220505A00026	5/9/2022	2.69	8/22/2023	5/9/2022	101.03812	100.39298	99.75606813	99.12723074	98.50631486	97.89317141	97.287655	96.68962389	96.0989398
220510A00014	5/13/2022	2.72	11/6/2023	5/13/2022	101.31785	100.4680976	99.63257989	98.81094169	98.00283915	97.20793967	96.42592147	95.65647317	94.89929333
220518A00008	5/18/2022	3.01	5/20/2024	5/18/2022	102.69141	101.3146627	99.96296206	98.63568464	97.33222566	96.05199984	94.79444065	93.55899953	92.34514522
220531A00020	5/31/2022	2.86	5/31/2024	5/31/2022	102.55268	101.1472688	99.76791875	98.41397096	97.08478486	95.77974099	94.49824011	93.23970235	92.00356648
220601A00022	6/1/2022	2.73	12/1/2023	6/1/2022	101.42635	100.5094372	99.60907486	98.72481415	97.85622601	97.00289656	96.16442637	95.34042985	94.53053464
220601A00038	6/3/2022	3.69	5/28/2032	6/3/2022	126.98218	117.1099957	108.1171914	99.91995669	92.4428944	85.61814	79.38457327	73.68711638	68.47610802
220602A00039	6/2/2022	3.11	6/2/2027	6/2/2022	112.91606	108.362594	104.021368	99.88137305	95.93223155	92.16415443	88.56790455	85.13476279	81.85649635
220622A00010	6/22/2022	3.43	7/12/2024	6/22/2022	103.70606	102.1803298	100.6847271	99.21843336	97.78065621	96.37063153	94.98762208	93.63091629	92.29982717
220624A00016	6/24/2022	3.34	6/24/2026	6/24/2022	110.53286	106.9739652	103.5505089	100.2566045	97.08665317	94.03532891	91.09756378	88.26853396	85.54364658
220630A00045	6/30/2022	3.39	6/30/2026	6/30/2022	110.00065	106.4544316	103.0434092	99.76169174	96.60368085	93.5640514	90.63773686	87.81991516	85.10599552
220701A00014	7/1/2022	3.15	7/14/2023	7/1/2022	101.15811	100.6179129	100.083493	99.55475364	99.03160435	98.51395671	98.00172412	97.4948218	96.99316672
220711A00020	7/11/2022	3.25	1/11/2024	7/11/2022	102.34602	101.3120989	100.2990744	99.30631476	98.33321589	97.37919744	96.44370173	95.52619264	94.6261546
220726A00059	7/26/2022	3.34	1/26/2024	7/26/2022	102.33462	101.2636831	100.2151657	99.18836873	98.18262211	97.19728292	96.23173423	95.28538379	94.35766274
220726A00060	7/26/2022	3.32	7/26/2024	7/26/2022	103.65338	102.0897335	100.5573807	99.0554516	97.58310592	96.13953409	94.72395572	93.33561832	91.97379605
220729A00035	8/3/2022	3.14	8/3/2027	8/3/2022	112.57136	107.8858524	103.4252593	99.17756611	95.13146534	91.27631106	87.60207678	84.09931589	80.75912493
220815A00004	8/15/2022	3.54	2/15/2024	8/15/2022	102.67394	101.5479738	100.4467383	99.36941992	98.31524476	97.28347209	96.27339248	95.28432624	94.31562181
220815A00006	8/15/2022	3.52	8/15/2024	8/15/2022	104.14428	102.5232403	100.9353077	99.3795344	97.85500654	96.36084477	94.89620257	93.46026476	92.05224599
220819A00037	8/19/2022	3.61	2/20/2024	8/19/2022	102.78804	101.6480928	100.5334697	99.4433284	98.37686807	97.33332233	96.31195758	95.31207129	94.33299032
220819A00038	8/19/2022	3.59	8/19/2024	8/19/2022	104.27783	102.6453458	101.0463373	99.47983835	97.94492005	96.440689	94.96628535	93.52088129	92.1036795
220823A00056	8/23/2022	3.5	8/23/2024	8/23/2022	104.51296	102.8618795	101.2448848	99.66098674	98.10923274	96.58870672	95.09852736	93.63784647	92.20584739
220823A00060	8/23/2022	3.5	8/23/2024	8/23/2022	104.51296	102.8618795	101.2448848	99.66098674	98.10923274	96.58870672	95.09852736	93.63784647	92.20584739
220826A00033	8/26/2022	3.73	8/26/2025	8/26/2022	108.10373	105.423396	102.8238072	100.3020224	97.8552276	95.48073068	93.17595489	90.93843322	88.76580286
220830A00055	8/30/2022	3.7	8/30/2029	8/30/2022	120.32015	113.3728292	106.8843983	100.8219463	95.15509822	89.85580396	84.89814777	80.25817507	75.91373406
220902A00042	9/2/2022	3.89	9/5/2023	9/2/2022	101.90878	101.2226793	100.545826	99.87803337	99.21912012	98.56890981	97.92723067	97.2939154	96.66880107
220902A00043	9/2/2022	3.91	3/4/2024	9/2/2022	103.23498	102.0576936	100.9073226	99.78294693	98.68369162	97.6087207	96.55723494	95.52846986	94.52169385
220909A00052	9/9/2022	3.95	3/8/2024	9/9/2022	103.31511	102.126663	100.9656235	99.83105464	98.72205737	97.63777308	96.57738122	95.54009725	94.52517067
220916A00042	9/16/2022	4.07	9/16/2030	9/16/2022	127.5384	119.2248796	111.5339501	104.4152631	97.82280506	91.71450584	86.05188033	80.79970477	75.92572385
220916A00043	9/16/2022	4.07	9/16/2031	9/16/2022	130.7174	121.2648137	112.598599	104.6484266	97.35062849	90.64753574	84.48688346	78.8212772	73.60771483
220920A00050	9/20/2022	4.37	9/20/2024	9/20/2022	105.93275	104.2005951	102.5052048	100.8454746	99.22034223	97.62878752	96.06983085	94.5425309	93.04598275
220922A00042	9/22/2022	4.6	3/22/2024	9/22/2022	104.24483	103.012855	101.8101438	100.6356582	99.48841126	98.36746136	97.27191005	96.20089939	95.15360975
220923A00035	9/23/2022	4.7	3/22/2024	9/23/2022	104.36836	103.1355835	101.9320813	100.7568177	99.60880526	98.48710221	97.3908097	96.31906947	95.27106159
220927A00024	9/27/2022	4.7	9/27/2024	9/27/2022	106.5888	104.8321086	103.1129836	101.4302843	99.7829159	98.169828	96.59001217	95.04249984	93.52636024

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
220927A00071	9/27/2022	4.7	9/26/2024	9/27/2022	106.57677	104.8228558	103.1064048	101.4262824	99.78139841	98.17070635	96.5932016	95.04791918	93.53393172
220927A00073	9/27/2022	4.72	9/26/2025	9/27/2022	111.12063	108.3159698	105.5975894	102.9622673	100.4069245	97.92861932	95.52454029	93.1919992	90.92842467
221006A00033	10/6/2022	4.56	10/7/2024	10/6/2022	106.46252	104.6796005	102.9353129	101.2285038	99.55806392	97.92292749	96.32207	94.75450614	93.21928794
221007A00003	10/7/2022	4.67	10/7/2025	10/7/2022	111.11968	108.2846522	105.537673	102.8754487	100.2948363	97.79283159	95.36656191	93.0132795	90.73035504
221011A00036	10/11/2022	4.59	10/6/2026	10/11/2022	115.45538	111.5416118	107.7850295	104.1784035	100.7148857	97.3879829	94.19153558	91.11969896	88.16692471
221011A00037	10/11/2022	4.68	10/7/2024	10/11/2022	106.67604	104.8911657	103.1449601	101.4362679	99.76397877	98.12702612	96.5243845	94.95506776	93.41812709
221012A00051	10/12/2022	4.7	10/11/2024	10/12/2022	106.7612	104.9644649	103.2068711	101.4872579	99.80451308	98.15756709	96.54539085	94.96699388	93.42142245
221014A00026	10/14/2022	4.63	10/14/2027	10/14/2022	120.25086	115.1899201	110.3782614	105.8022123	101.4489272	97.30633073	93.36306721	89.60845388	86.03243734
221014A00037	10/14/2022	4.86	10/15/2024	10/14/2022	107.09895	105.2880258	103.5167488	101.7839639	100.0885556	98.42945016	96.80561355	95.21604975	93.65979892
221014A00043	10/14/2022	4.49	10/14/2027	10/14/2022	120.68008	115.5754306	110.7230175	106.108972	101.7202613	97.54463615	93.57057976	89.78725939	86.18448227
221014A00050	10/14/2022	4.49	10/14/2027	10/14/2022	120.68008	115.5754306	110.7230175	106.108972	101.7202613	97.54463615	93.57057976	89.78725939	86.18448227
221018A00006	10/18/2022	4.55	10/18/2027	10/18/2022	119.8616	114.8000779	109.9884716	105.4130607	101.0609536	96.92003067	92.97889459	89.22682282	85.65372434
221018A00046	10/18/2022	4.9	4/30/2024	10/18/2022	105.1041	103.7644528	102.4483125	101.1551122	99.88430224	98.6353502	97.40774005	96.20097164	95.01456002
221018A00047	10/18/2022	4.78	10/20/2025	10/18/2022	111.59128	108.7132555	105.9256034	103.2249675	100.6081373	98.07204057	95.61373644	93.23040878	90.91936017
221018A00048	10/18/2022	4.71	10/19/2026	10/18/2022	116.07969	112.1173306	108.3153598	104.6664023	101.1634629	97.79990505	94.5694306	91.46606052	88.48411689
221018A00049	10/18/2022	4.59	10/18/2027	10/18/2022	120.05337	114.987301	110.1713081	105.5916678	101.2354812	97.09062235	93.14568756	89.38994836	85.81330809
221026A00031	10/26/2022	4.9	4/26/2024	10/26/2022	105.0522	103.7232954	102.4187668	101.1379787	99.88031607	98.64518529	97.43201285	96.24024466	95.06934522
221026A00032	10/26/2022	4.81	10/25/2024	10/26/2022	107.13582	105.296861	103.4987074	101.740201	100.0202208	98.33768528	96.69155088	95.0808101	93.50449021
221028A00043	10/28/2022	4.88	4/24/2024	10/28/2022	104.99974	103.6763867	102.3778467	101.1034456	99.85253622	98.62449444	97.41871843	96.23462746	95.07166105
221028A00056	10/28/2022	4.77	10/28/2024	10/28/2022	107.10044	105.2535065	103.4477292	101.6819404	99.95501726	98.26587609	96.61347027	94.99678893	93.41485541
221031A00003	10/31/2022	4.89	11/12/2024	10/31/2022	107.4913	105.6006711	103.7529718	101.946976	100.1814988	98.45539645	96.76756485	95.11693771	93.50248513
221031A00004	10/31/2022	4.79	10/28/2025	10/31/2022	111.72197	108.8197125	106.0092238	103.2871032	100.6500993	98.09509848	95.61911794	93.21929984	90.89290518
221031A00044	10/31/2022	4.89	10/31/2024	10/31/2022	107.35925	105.5016698	103.6856292	101.9099628	100.1735409	98.47527235	96.81410333	95.18901541	93.5990244
221031A00045	10/31/2022	4.79	10/31/2025	10/31/2022	111.76009	108.8489962	106.0301819	103.3002333	100.6558799	98.09398937	95.61156073	93.20571831	90.87370574
221103A00050	11/3/2022	5.14	11/4/2024	11/3/2022	107.85466	105.981989	104.1513898	102.3616755	100.6116964	98.90034217	97.2265406	95.58925584	93.98748695
221107A00056	11/7/2022	4.73	11/8/2027	11/7/2022	120.96935	115.8223516	110.9319225	106.2838852	101.8649188	97.66250197	93.66486093	89.86092097	86.24026161
221110A00036	11/10/2022	4.56	11/10/2025	11/10/2022	111.22537	108.2949295	105.4582466	102.7118156	100.0522858	97.47644903	94.98123306	92.56369505	90.22101536
221110A00037	11/10/2022	4.45	11/10/2026	11/10/2022	115.36279	111.3529474	107.5079066	103.8200218	100.2820444	96.88709741	93.62865487	90.50052168	87.49681534
221110A00039	11/10/2022	4.34	11/10/2027	11/10/2022	119.0978	113.9902546	109.1381682	104.5273989	100.1446554	95.9774457	92.01402481	88.24334635	84.6550176
221110A00084	11/10/2022	4.56	11/6/2025	11/10/2022	111.17792	108.2589587	105.4330676	102.6967852	100.0467959	97.47992462	94.9931304	92.58349982	90.24824104
221110A00086	11/10/2022	4.34	11/8/2027	11/10/2022	119.07725	113.9756757	109.1290096	104.5231529	100.1448554	95.98166306	92.02186553	88.25444849	84.66904872
221116A00026	11/16/2022	4.78	11/15/2024	11/16/2022	107.34077	105.4432191	103.5889377	101.7766789	100.0052441	98.27347652	96.58025942	94.92451466	93.30520098
221116A00027	11/16/2022	4.46	11/14/2025	11/16/2022	110.98493	108.047199	105.2037981	102.4511963	99.78601061	97.20500259	94.70507158	92.28324791	89.93668668

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221116A00028	11/16/2022	4.21	11/16/2027	11/16/2022	118.57869	113.465601	108.6092477	103.9953661	99.61055501	95.4422214	91.47852794	87.70834379	84.12119896
221118A00008	11/18/2022	5.09	11/30/2023	11/18/2022	103.60646	102.6813339	101.772789	100.8803865	100.0036984	99.14231169	98.29582783	97.46386192	96.64604223
221122A00011	11/22/2022	5.14	5/22/2024	11/22/2022	105.69171	104.2875822	102.9090602	101.5555056	100.2262972	98.92083412	97.63853468	96.37883585	95.14119244
221122A00015	11/22/2022	4.97	11/22/2024	11/22/2022	107.76937	105.8492958	103.9733691	102.1403086	100.3488809	98.59789644	96.88620704	95.21270457	93.57631917
221122A00041	11/22/2022	4.97	11/22/2024	11/22/2022	107.76937	105.8492958	103.9733691	102.1403086	100.3488809	98.59789644	96.88620704	95.21270457	93.57631917
221130A00069	11/30/2022	4.15	11/30/2027	11/30/2022	119.54538	114.3356642	109.3900704	104.6937842	100.2328958	95.99434247	91.96585286	88.13589504	84.49362819
221130A00075	11/30/2022	4.15	11/30/2027	11/30/2022	119.54538	114.3356642	109.3900704	104.6937842	100.2328958	95.99434247	91.96585286	88.13589504	84.49362819
221130A00078	11/30/2022	4.15	11/30/2027	11/30/2022	119.54538	114.3356642	109.3900704	104.6937842	100.2328958	95.99434247	91.96585286	88.13589504	84.49362819
221130A00081	11/30/2022	4.15	11/30/2027	11/30/2022	119.54538	114.3356642	109.3900704	104.6937842	100.2328958	95.99434247	91.96585286	88.13589504	84.49362819
221201A00011	12/1/2022	3.95	12/1/2027	12/1/2022	118.56763	113.3789112	108.4537234	103.7772628	99.33563555	95.11579491	91.10548512	87.29318961	83.66808267
221230A00111	12/30/2022	4.42	12/30/2026	12/30/2022	115.85766	111.6994852	107.7177594	103.9040337	100.2503052	96.74899571	93.39292653	90.17529546	87.08965488
221214A00002	12/14/2022	4.62	12/13/2024	12/14/2022	107.35432	105.3811906	103.4547183	101.5735093	99.73622481	97.9415747	96.18831542	94.47524791	92.80121574
221220A00029	12/20/2022	4.7	12/20/2024	12/20/2022	107.59734	105.602523	103.6553032	101.7542488	99.89798172	98.0851744	96.31454763	94.58486845	92.89494816
221222A00012	12/22/2022	4.35	12/16/2025	12/22/2022	111.03363	108.0078475	105.0819653	102.2521302	99.51466232	96.86604407	94.30291172	91.82204787	89.42037426
221221A00038	12/21/2022	4.43	12/20/2024	12/21/2022	107.48634	105.4847494	103.5310613	101.6238302	99.76166544	97.94322786	96.16722707	94.43241954	92.73760646
221221A00046	12/21/2022	4.33	12/19/2025	12/21/2022	111.00878	107.9750785	105.0418019	102.2050727	99.46118216	96.806585	94.23789177	91.75186083	89.34539108
221213A00056	12/13/2022	4.02	5/13/2026	12/13/2022	112.42111	108.9447961	105.5963962	102.3705329	99.26207947	96.26615072	93.37809053	90.59345978	87.90802511
221228A00075	12/28/2022	4.09	12/28/2027	12/28/2022	119.53747	114.2481979	109.2310965	104.4706679	99.9523767	95.66258665	91.58850023	87.71810271	84.04011024
221209A00037	12/9/2022	3.91	12/9/2027	12/9/2022	118.44842	113.2399115	108.2971093	103.6050226	99.14958556	94.91759332	90.89664545	87.07509268	83.44198756
221219A00009	12/19/2022	4.83	6/19/2024	12/19/2022	105.58582	104.1074071	102.6573046	101.2347656	99.83907223	98.46953066	97.12547067	95.80624445	94.5112257
221230A00109	12/30/2022	4.56	12/30/2025	12/30/2022	111.82615	108.7497161	105.7760186	102.9010446	100.1209661	97.4321259	94.83102906	92.31433448	89.87884738
221208A00058	12/8/2022	4.41	12/8/2025	12/8/2022	111.1179	108.1130212	105.2066307	102.3949639	99.67441815	97.04154809	94.49305814	92.025795	89.63674065
221209A00035	12/9/2022	3.91	12/9/2027	12/9/2022	118.44842	113.2399115	108.2971093	103.6050226	99.14958556	94.91759332	90.89664545	87.07509268	83.44198756
221208A00059	12/8/2022	4.25	12/8/2026	12/8/2022	114.91747	110.8394414	106.9321677	103.1875804	99.59803814	96.15629874	92.85549639	89.68912002	86.6509931
221214A00046	12/14/2022	4.02	12/14/2027	12/14/2022	117.91667	112.7423173	107.8318048	103.1702533	98.74369661	94.53902405	90.5439233	86.7468279	83.13686826
221208A00061	12/8/2022	4.11	12/8/2027	12/8/2022	118.30418	113.1371378	108.2325992	103.5758073	99.15291209	94.95090872	90.95758167	87.1614529	83.55173357
221222A00024	12/22/2022	4.35	12/15/2025	12/22/2022	111.02208	107.9992394	105.0761117	102.2488573	99.51380637	96.86745067	94.30643523	91.82755095	89.42772732
221201A00048	12/1/2022	4.22	12/1/2027	12/1/2022	118.77713	113.6182142	108.7202541	104.068642	99.6496616	95.45043049	91.45884495	87.66352904	84.05378724
221222A00026	12/22/2022	4.22	12/15/2026	12/22/2022	114.88155	110.7846611	106.8601243	103.0997593	99.49581827	96.04096046	92.72822827	89.5510254	86.50309607
221216A00023	12/16/2022	4.04	12/13/2027	12/16/2022	118.0062	112.8324493	107.9223394	103.2610098	98.83451266	94.62975399	90.63443679	86.83700851	83.22661224
221221A00048	12/21/2022	4.22	12/21/2026	12/21/2022	114.95206	110.8370178	106.8957672	103.1200254	99.50195066	96.03411464	92.70947853	89.52137049	86.46346449
221230A00108	12/30/2022	4.8	12/30/2024	12/30/2022	107.92113	105.8955233	103.9188753	101.9896901	100.1065323	98.26802017	96.47282282	94.71965818	93.00729076
221222A00035	12/30/2022	4.34	12/30/2025	12/30/2022	111.16524	108.0987819	105.1348095	102.2693189	99.49848981	96.8186728	94.22638015	91.71827786	89.2911779

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
221214A00079	12/14/2022	3.84	12/14/2027	12/14/2022	118.14906	112.9337352	107.9852726	103.2885748	98.82947649	94.59468227	90.57170876	86.74883092	83.11503212
221222A00013	12/22/2022	4.34	12/23/2025	12/22/2022	111.0846	108.0387042	105.093985	102.2465217	99.49256476	96.82853111	94.25099552	91.75668271	89.34245992
221205A00034	12/5/2022	4.89	6/5/2024	12/5/2022	105.50837	104.0676944	102.6539401	101.2664198	99.90446546	98.56743153	97.25469364	95.96564782	94.69970974
221208A00062	12/8/2022	4.24	12/8/2028	12/8/2022	121.98074	115.7058442	109.804382	104.2520512	99.02625651	94.10597981	89.47166196	85.10509451	80.98931981
221214A00077	12/14/2022	3.84	12/14/2027	12/14/2022	118.14906	112.9337352	107.9852726	103.2885748	98.82947649	94.59468227	90.57170876	86.74883092	83.11503212
221201A00037	12/1/2022	4.26	12/1/2026	12/1/2022	114.87384	110.8162526	106.9277796	103.2004671	99.62678102	96.19957887	92.91208754	89.75788216	86.7308664
221208A00050	12/8/2022	4.11	12/8/2027	12/8/2022	118.30418	113.1371378	108.2325992	103.5758073	99.15291209	94.95090872	90.95758167	87.1614529	83.55173357
221201A00009	12/1/2022	4.22	12/1/2025	12/1/2022	111.11963	108.1195356	105.2174668	102.4096882	99.69262647	97.06286363	94.51712976	92.05229556	89.66536549
221208A00005	12/8/2022	4.88	12/8/2037	12/8/2022	151.14533	134.7009713	120.3917673	107.9208547	97.03449528	87.51559011	79.17819966	71.86290825	65.43289978
221230A00087	12/30/2022	4.56	1/2/2026	12/30/2022	111.8625	108.7773583	105.7954291	102.9126814	100.1252614	97.42948765	94.82184252	92.29896362	89.85763614
221213A00070	12/13/2022	4.07	12/13/2027	12/13/2022	118.15464	112.9772579	108.0636509	103.3989526	98.96920957	94.76132215	90.76298812	86.96265	83.34944616
221222A00027	12/22/2022	4.16	12/15/2027	12/22/2022	118.56597	113.374594	108.4477997	103.7706645	99.3291839	95.11021116	91.10140032	87.29115336	83.66857117
221213A00051	12/13/2022	4.02	12/13/2027	12/13/2022	117.90724	112.7359102	107.8281318	103.1690479	98.74471471	94.54204189	90.5487359	86.75324751	83.14472296
221223A00025	12/23/2022	4.25	12/23/2027	12/23/2022	119.09188	113.86518	108.9058115	104.1986357	99.72945085	95.48492881	91.45255665	87.62058258	83.97796582
221228A00094	12/28/2022	4.95	6/28/2024	12/28/2022	105.87156	104.3670901	102.8918577	101.4450877	100.0260279	98.6339521	97.26815906	95.92797125	94.61273399
221208A00006	12/8/2022	4.88	12/8/2037	12/8/2022	151.14533	134.7009713	120.3917673	107.9208547	97.03449528	87.51559011	79.17819966	71.86290825	65.43289978
221230A00086	12/30/2022	4.8	1/2/2025	12/30/2022	107.95858	105.9244981	103.9396898	102.0026529	100.1119379	98.26614974	96.46394472	94.70402876	92.985155
221216A00013	12/16/2022	4.04	12/16/2027	12/16/2022	117.98116	112.8013109	107.885796	103.2196914	98.78899369	94.58055783	90.58204007	86.78184507	83.16907674
221207A00101	12/7/2022	4.87	6/7/2024	12/7/2022	105.50319	104.0572422	102.63841	101.2459981	99.87933173	98.5377584	97.22064738	95.92738859	94.65739182
221230A00059	12/30/2022	4.47	6/30/2025	12/30/2022	109.93953	107.3796913	104.8937946	102.479275	100.133669	97.85461352	95.63984139	93.48717661	91.39453014
221222A00014	12/22/2022	4.65	12/23/2024	12/22/2022	107.53475	105.5323255	103.5778721	101.6699413	99.80713866	97.98812129	96.2115954	94.47631415	92.78107564
221230A00072	12/30/2022	4.8	12/31/2024	12/30/2022	107.93361	105.90518	103.925811	101.9940077	100.1083299	98.26739139	96.46985707	94.71444084	92.99990344
221201A00006	12/1/2022	4.77	12/2/2024	12/1/2022	107.5113	105.5668864	103.6677579	101.8125888	100.0000984	98.22905161	96.49825739	94.80656657	93.1528702
221205A00088	12/5/2022	4.13	12/3/2027	12/5/2022	118.35421	113.1999656	108.3068597	103.6602546	99.24640717	95.05241057	91.06613919	87.27619747	83.67187224
221230A00055	12/30/2022	4.59	12/30/2024	12/30/2022	107.9302	105.8964281	103.9119481	101.9752557	100.0849019	98.23949194	96.43768286	94.67818086	92.95973938
221221A00049	12/21/2022	4.15	12/21/2027	12/21/2022	118.57497	113.3665802	108.4244776	103.7335968	99.27980081	95.04982148	91.03120145	87.21224053	83.58194577
221230A00088	12/30/2022	4.42	12/30/2026	12/30/2022	115.85766	111.6994852	107.7177594	103.9040337	100.2503052	96.74899571	93.39292653	90.17529546	87.08965488
221208A00001	12/8/2022	4.6	12/8/2033	12/8/2022	139.557	127.5920967	116.8266606	107.1317992	98.39318053	90.50931642	83.3900567	76.95526715	71.13366763
090429A00044	4/29/2009	4.1	4/29/2024	4/29/2014	99.989957	99.98738924	99.94911652	99.76201537	99.31853454	98.75174825	98.15125818	97.54792343	96.95218815
130416A00025	4/16/2013	2.27	4/18/2028	4/16/2018	99.659312	99.21945042	98.18808601	96.61393325	94.65691652	92.50152554	90.30365434	88.14996553	86.07123827
140508A00011	5/8/2014	2.32	5/8/2024	5/8/2019	99.945431	99.84448853	99.46715702	98.88532573	98.23879921	97.58241778	96.9328061	96.29330899	95.6640608
140723A00038	7/23/2014	2.3	7/23/2024	7/23/2019	99.932468	99.80781286	99.38514022	98.745513	98.030401	97.3002918	96.57652663	95.86415152	95.16360283
141119A00005	11/19/2014	2.53	11/19/2024	11/19/2019	99.898793	99.74582772	99.26716499	98.53519127	97.69657008	96.82636244	95.95839353	95.10361171	94.26400277

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150202A00006	2/2/2015	1.92	2/3/2025	2/3/2020	99.815278	99.51827379	98.86763053	97.99147894	97.0259797	96.04094867	95.06549417	94.10760778	93.16813137
151223A00007	12/23/2015	3.76	12/23/2030	12/23/2022	99.780337	99.44520323	98.37138353	96.21358239	92.98202773	88.93199631	84.46250177	79.95393794	75.65035339
161012A00020	10/11/2016	2.96	10/14/2031	10/11/2023	100.40137	99.05258495	96.93461169	93.75284907	89.56888349	84.77123316	79.85471052	75.1293595	70.7222847
170515A00052	5/15/2017	3.78	5/15/2042	5/15/2024	102.86749	101.0511539	98.57707303	95.01264972	90.07936429	84.17810113	78.22493391	72.76874156	67.88035812
170519A00006	5/19/2017	3	5/19/2032	5/19/2022	99.715863	99.33286244	98.20819288	96.1768055	93.36936874	90.04217667	86.54507652	83.12187128	79.87776941
170705A00037	7/5/2017	2.85	7/6/2032	7/6/2027	108.07633	104.3460737	100.6262072	96.90163915	93.17815242	89.501492	85.93014941	82.52025649	79.30119011
170802A00074	8/2/2017	2.92	8/2/2027	8/2/2022	99.686655	99.32850585	98.35015734	96.68199016	94.4451162	91.83181642	89.05687901	86.28027384	83.59254691
170809A00042	8/9/2017	2.35	8/9/2027	8/9/2022	99.725364	99.362481	98.47141855	97.08155935	95.34992401	93.43943896	91.48402853	89.559111	87.69320836
171004A00022	10/4/2017	2.74	10/4/2027	10/4/2022	99.708576	99.35763707	98.38375333	96.70774236	94.44616496	91.79224744	88.96629244	86.13617796	83.39827309
171005A00047	10/5/2017	3.29	10/5/2032	10/5/2022	99.694218	99.26120338	97.9397698	95.47421639	91.93149658	87.67239345	83.16453216	78.76753806	74.64553356
180105A00005	1/5/2018	3.07	1/5/2028	1/5/2023	99.913701	99.74060451	99.14897032	98.01833884	96.43524297	94.54257589	92.49367609	90.41065764	88.37292257
180105A00006	1/5/2018	3.07	1/5/2028	1/5/2023	99.913701	99.74060451	99.14897031	98.01833882	96.43524295	94.54257585	92.49367604	90.41065758	88.37292249
180130A00087	1/30/2018	2.92	1/31/2028	1/30/2023	99.957061	99.69665492	99.00898832	97.80082711	96.15541654	94.22056929	92.15276699	90.0685597	88.03677888
180302A00003	3/2/2018	3.89	3/2/2033	3/2/2023	100.14605	99.73492874	98.68779309	96.58198868	93.24259669	88.87673764	83.97122593	79.0041619	74.29100889
180315A00030	3/15/2018	3.76	3/15/2033	3/17/2025	105.5159	102.9520252	100.0237674	96.53135904	92.38569599	87.59731941	82.49397244	77.44111442	72.69179669
180504A00024	5/4/2018	3.62	5/4/2028	5/4/2023	100.48969	99.994595	99.09705041	97.58291771	95.33059977	92.41393575	89.05423466	85.4974913	81.97482472
180627A00005	6/27/2018	3.63	6/30/2033	6/30/2023	100.98745	100.2454366	99.09865486	97.31925204	94.73393725	91.44363499	87.75370994	84.00911411	80.42759667
180703A00033	7/3/2018	3.4	7/3/2028	7/3/2023	100.69864	100.1233195	99.27411132	98.0467766	96.39810314	94.40243033	92.21323897	89.96992403	87.77238074
190111A00040	1/11/2019	3.74	1/11/2034	1/11/2024	101.92511	100.6118355	98.79962145	96.18070341	92.5788875	88.10066821	83.23347764	78.44068417	73.95836161
190116A00015	1/16/2019	3.61	1/17/2034	1/16/2024	101.73645	100.5062975	98.88858842	96.65199115	93.68335839	90.07123782	86.17368616	82.31319051	78.66324536
190204A00054	2/4/2019	3.98	2/6/2034	2/2/2024	102.55062	100.9875899	98.92088977	96.04427393	92.15847759	87.35467439	82.12415201	76.96792834	72.152914
190222A00023	2/22/2019	3.66	2/22/2034	2/22/2026	108.23875	104.4813445	100.3861073	95.79574927	90.63650353	85.0379101	79.3138143	73.80278674	68.70972448
190301A00015	3/1/2019	3.86	3/1/2034	3/2/2026	108.05831	104.4596392	100.5296702	96.11561188	91.12774013	85.68627651	80.08958003	74.67881216	69.66699904
190409A00016	4/9/2019	2.91	4/9/2029	4/9/2024	102.04475	100.4851849	98.61779295	96.29566508	93.46139171	90.21772666	86.79470892	83.40667013	80.1692795
190409A00017	4/9/2019	3.01	4/9/2029	4/9/2024	102.16028	100.5422007	98.58123097	96.11104417	93.0593914	89.52693913	85.76932482	82.03385751	78.46560078
190430A00020	4/30/2019	3.41	4/28/2034	4/28/2026	107.78084	103.7781009	99.40735704	94.50409851	89.08481808	83.30264311	77.51499707	72.03353244	67.00411823
190520A00018	5/20/2019	3.7	5/20/2044	5/20/2024	102.25841	100.1372844	97.04361806	92.46361149	86.37467591	79.71797878	73.47071145	67.90716357	62.97827512
190530A00044	5/30/2019	2.85	5/30/2034	5/30/2024	101.73544	99.99432423	97.78130554	94.88899481	91.30953331	87.29291075	83.22198187	79.33746615	75.71024846
190807A00041	8/7/2019	2.27	8/7/2034	7/7/2024	100.84307	98.76444291	96.05475581	92.59553206	88.55596487	84.33027285	80.2439135	76.41928544	72.86543952
190807A00044	8/7/2019	2.27	8/7/2034	8/7/2024	100.98849	98.84082087	96.08301253	92.60158293	88.55647692	84.33028056	80.24391326	76.41928513	72.86543916
190827A00044	8/27/2019	1.9	8/27/2029	8/27/2024	101.00674	99.30753073	97.34250587	95.04619915	92.47989619	89.79876602	87.14970282	84.60136523	82.16627875
190930A00079	9/30/2019	2.04	10/1/2029	9/30/2024	101.50746	99.70518723	97.67688015	95.36038471	92.78570568	90.08615267	87.40532463	84.82117319	82.35230757
190930A00083	9/30/2019	2.04	10/1/2029	9/30/2024	101.50746	99.7051869	97.67687948	95.36038357	92.78570398	90.08615037	87.40532175	84.82116978	82.35230367

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191007A00012	10/7/2019	2	10/5/2029	10/7/2024	100.93425	99.12734168	97.0528609	94.65144057	92.00342943	89.26636245	86.57982046	84.0024005	81.54208912
191007A00013	10/7/2019	2	10/5/2029	10/7/2024	100.93425	99.1273415	97.05286037	94.65143961	92.00342799	89.26636051	86.57981803	84.0023976	81.54208577
191028A00015	10/28/2019	2.49	10/27/2034	10/28/2024	101.83927	99.58506605	96.81274209	93.39169504	89.39241525	85.14505653	80.98952977	77.08654347	73.46059971
191031A00036	10/31/2019	2.9	10/31/2039	10/31/2024	101.79732	99.11006051	95.59651068	91.01125845	85.62352737	80.08742675	74.90039668	70.18999747	65.92776364
191031A00037	10/31/2019	2.59	10/30/2034	10/31/2024	101.59146	99.30035532	96.4665472	92.98466851	88.95057695	84.71047774	80.59164871	76.7312404	73.14511353
191220A00029	12/20/2019	2.57	12/19/2031	12/20/2024	102.11618	100.0133063	97.60461201	94.77929523	91.5841427	88.18945421	84.81830365	81.59664529	78.55487701
200108A00009	1/8/2020	2.4	1/8/2035	1/8/2025	101.84399	99.32926613	96.27171426	92.55756372	88.32044633	83.91700495	79.67232202	75.71680208	72.05835088
200108A00040	1/8/2020	2.52	1/8/2030	1/8/2025	101.91403	99.48609179	96.63316881	93.21997202	89.34042824	85.22455661	81.14940951	77.26822189	73.6205286
200110A00012	1/10/2020	2.57	1/10/2035	1/10/2025	101.8736	99.38761818	96.3800134	92.75138364	88.61144168	84.2964775	80.12163805	76.21778656	72.59671801
200115A00023	1/15/2020	2.16	1/15/2030	1/15/2025	101.60517	99.61551025	97.40572216	94.91747319	92.19860865	89.38264775	86.60885873	83.94644577	81.40801995
200115A00025	1/15/2020	2.1	1/15/2025	1/15/2023	99.640579	99.16981517	98.24010341	96.96795702	95.51935711	94.01423943	92.51778965	91.0518146	89.61972727
200306A00021	3/6/2020	1.16	3/6/2030	3/6/2025	99.643957	97.32844056	94.7153796	91.85072688	88.9079773	86.03502133	83.28940525	80.67639359	78.18926017
200309A00013	3/9/2020	1.1	3/8/2030	3/9/2025	99.519193	97.18268177	94.54521649	91.66477963	88.7186519	85.84957889	83.10981945	80.50260583	78.02099954
200316A00030	3/16/2020	1.35	3/15/2030	3/16/2025	100.5638	98.33048807	95.82718611	93.05497527	90.1379864	87.23492704	84.44054384	81.77835019	79.24468132
200316A00032	3/16/2020	1.35	3/15/2030	3/16/2025	100.5638	98.33048794	95.82718584	93.05497483	90.13798578	87.23492623	84.44054285	81.77834904	79.24468001
200318A00015	3/18/2020	1.69	3/18/2030	3/18/2023	99.1642	98.10980337	96.25943799	93.72944744	90.8163392	87.81539076	84.89606844	82.11115056	79.46286849
200326A00035	3/26/2020	1.68	3/26/2030	3/26/2025	100.84196	98.62575362	96.15796083	93.43002095	90.54215113	87.64963986	84.85656884	82.19318404	79.65782391
200423A00008	4/23/2020	1.59	4/23/2030	4/23/2025	100.38938	97.17138646	93.40970635	89.094388	84.48589544	79.9087213	75.55761243	71.48443646	67.68192803
200423A00009	4/23/2020	1.59	4/23/2030	4/23/2025	100.38938	97.17138663	93.40970668	89.09438852	84.48589616	79.90872222	75.55761354	71.48443775	67.68192947
200423A00010	4/23/2020	1.59	4/23/2030	4/23/2025	100.38938	97.17138679	93.40970692	89.09438888	84.48589666	79.90872285	75.55761429	71.48443861	67.68193044
200430A00021	4/30/2020	1.2	4/30/2030	4/30/2025	99.915829	97.48033542	94.79406952	91.8876732	88.91422808	86.01230179	83.2393784	80.60150866	78.0919081
200505A00010	5/5/2020	0.89	5/6/2030	5/5/2025	99.617235	97.16108454	94.42162463	91.45593001	88.43625075	85.50196236	82.7039165	80.04434484	77.5157832
200512A00023	5/12/2020	1.78	5/11/2035	5/12/2025	100.01516	96.24297425	91.61179381	86.22179024	80.58071785	75.17347582	70.20204466	65.67906896	61.56597
200609A00003	6/9/2020	1.66	6/8/2035	6/9/2025	99.332605	95.03452441	89.77903055	83.79868107	77.69630805	71.94154704	66.70251916	61.9730851	57.70426505
200612A00001	6/12/2020	0.75	6/12/2030	6/12/2025	99.436727	96.82140356	93.95487755	90.91126923	87.85563789	84.90709616	82.10075698	79.43501102	76.90181759
201022A00008	10/22/2020	1.02	10/22/2035	10/22/2025	98.701943	94.84765908	90.4222983	85.67110824	80.98529976	76.59471886	72.54354052	68.81063028	65.36704904
201029A00008	10/29/2020	0.92	10/29/2030	10/29/2025	99.386775	96.5901285	93.56662119	90.39504013	87.23876177	84.20502052	81.32400994	78.5922755	76.0008834
201030A00025	10/30/2020	2.02	10/28/2050	10/30/2025	99.216844	93.15990266	85.46453244	77.13462771	69.42817712	62.73643269	56.99265036	52.05748853	47.79906817
201116A00019	11/16/2020	1.32	11/15/2030	11/16/2025	99.434016	95.68837575	91.4956682	86.94747868	82.34047858	77.91431792	73.76398814	69.89593222	66.2923879
201118A00015	11/18/2020	1.66	11/18/2036	11/18/2027	100.86124	94.52000086	87.70234934	80.6676014	73.86250177	67.6181491	62.02896425	57.05257552	52.61881249
201118A00017	11/18/2020	1.66	11/18/2036	11/18/2027	100.86124	94.5200031	87.70235264	80.66760582	73.86250723	67.61815546	62.02897134	57.05258319	52.61882062
201118A00018	11/18/2020	1.85	11/18/2036	11/18/2027	100.73565	94.43170084	87.65647573	80.67350937	73.92568193	67.73583973	62.19344483	57.2555949	52.85310624
201202A00016	12/2/2020	1.32	12/3/2035	12/2/2025	99.046889	95.18258568	90.76331676	86.00767864	81.29834672	76.8753726	72.79399404	69.03501097	65.56908001

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
201202A00017	12/2/2020	1.32	12/3/2035	12/2/2025	99.046889	95.18258651	90.76331812	86.00768066	81.29834941	76.87537595	72.79399797	69.03501544	65.56908495
201229A00003	12/29/2020	1.28	12/30/2030	12/30/2025	99.251723	95.46443347	91.22165218	86.62982806	81.99259345	77.54749231	73.38460807	69.507684	65.89811851
201230A00018	12/30/2020	1.52	12/28/2035	12/28/2027	100.40931	94.21660824	87.59283835	80.77701389	74.17489882	68.08950143	62.61276298	57.71021748	53.31957855
210108A00007	1/8/2021	1.65	1/8/2036	1/8/2026	99.558644	94.80116377	89.17221139	82.92835622	76.65280434	70.79187035	65.48703787	60.71822586	56.42986612
210225A00010	2/25/2021	2.02	2/25/2041	2/25/2026	100.7303	96.06335251	90.57709506	84.52145347	78.48907852	72.92450262	67.92212213	63.43416611	59.3991456
210405A00013	4/5/2021	1.82	4/7/2036	4/5/2026	101.30371	97.35556876	92.98881672	88.2556555	83.44486882	78.83918309	74.56881401	70.6391497	67.02195238
210622A00004	6/22/2021	2.42	6/20/2036	6/22/2026	102.68927	97.92726626	92.49430288	86.42259258	80.11037485	74.03800289	68.48145202	63.48040522	58.98888148
210910A00009	9/10/2021	1.77	9/10/2036	9/10/2026	102.33956	98.11877289	93.54121278	88.64135626	83.67508303	78.91514376	74.50344933	70.4527743	66.73370762
210924A00016	9/24/2021	1.91	9/24/2036	9/24/2026	102.9174	98.7557991	94.23612173	89.38772496	84.43358123	79.64897048	75.19896894	71.11011041	67.35577416
211019A00005	10/19/2021	2.49	10/20/2036	10/19/2026	104.29695	99.44568057	93.99217631	87.89337795	81.47994481	75.22873407	69.47324984	64.29373778	59.65179365
211110A00017	11/10/2021	2.01	11/10/2036	11/10/2026	103.51418	99.26204087	94.67216745	89.77801183	84.77864889	79.93727941	75.42968531	71.28944785	67.49106196
211116A00012	11/16/2021	2.22	12/18/2034	11/16/2026	103.86158	99.9585399	95.84430367	91.51554948	87.09199954	82.7595909	78.66483622	74.85621832	71.32445612
211124A00008	11/24/2021	2.62	11/22/2041	11/24/2026	105.35145	100.5355122	95.14009692	89.14354934	82.86991242	76.83553406	71.35064182	66.44272257	62.04957881
211215A00020	12/15/2021	1.85	12/15/2031	12/15/2026	102.96609	99.57156876	96.10058008	92.54463523	88.98445409	85.51665788	82.21160603	79.09143021	76.15048323
211227A00012	12/27/2021	2.39	12/29/2036	12/27/2028	106.65577	100.0030782	93.10930612	86.0444959	79.05604255	72.45708879	66.4607317	61.10264534	56.32922691
220217A00024	2/17/2022	2.43	2/17/2027	2/17/2025	102.73831	100.6689581	98.4943985	96.16861037	93.69001059	91.11007966	88.51549959	85.9776157	83.53179067
220617A00069	6/17/2022	4.06	6/17/2027	6/17/2025	107.28874	104.9740434	102.652347	100.2985675	97.88451767	95.38678919	92.80772057	90.1605983	87.51103025
220831A00108	8/31/2022	4.07	8/31/2027	9/2/2025	108.31019	105.6388627	102.9737465	100.2866263	97.54880001	94.73760427	91.85605152	88.92172231	86.00344413
221212A00004	12/12/2022	4.36	12/10/2032	12/10/2027	115.17544	111.0260764	106.9581759	102.9553524	99.01253175	95.12733305	91.31044381	87.58623239	84.00464597
221214A00057	12/14/2022	4.65	12/14/2027	12/12/2025	111.14219	108.1026611	105.0759387	102.0293844	98.92882643	95.73900008	92.4477784	89.04126442	85.57339515
221222A00137	12/22/2022	5.4	12/22/2037	12/22/2027	120.501	115.4708526	110.4498541	105.4004171	100.2903153	95.07226589	89.77959049	84.51158125	79.47352121
210611A00010	6/11/2021	1.02	6/11/2026	6/11/2021	101.48559	98.35755005	95.34609558	92.44623698	89.65322974	86.96255719	84.36991824	81.87121591	79.46254646
160608A00029	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479036	99.50759742	96.57862655	93.75628968	91.03611021	88.41382419	85.88536904	83.4468729
210915A00018	9/15/2021	0.74	9/16/2024	9/15/2021	99.626331	98.01818244	96.44398992	94.90273681	93.39344705	91.9151834	90.46704546	89.04816785	87.65771843
160212A00047	2/12/2016	1.94	2/12/2026	2/12/2016	101.78799	100.2098328	98.67280495	97.17549769	95.71656498	94.29471677	92.90871622	91.5573771	90.23956134
170711A00010	7/11/2017	2.38	7/12/2027	7/11/2017	104.57748	102.2340686	99.9723858	97.78889127	95.68022304	93.64318846	91.67475443	89.77203835	87.93229959
200514A00008	5/14/2020	1.23	5/14/2030	5/14/2020	103.30189	97.62002964	92.32649704	87.39196367	82.789481	78.49427796	74.48357371	70.7364075	67.23348383
170504A00049	5/4/2017	2.63	5/6/2024	5/4/2017	102.03501	100.7285197	99.44519293	98.1844663	96.94579227	95.72864057	94.53249755	93.35686552	92.20126212
171207A00025	12/7/2017	2.91	12/7/2027	12/7/2017	111.08298	106.5539805	102.2495921	98.15734667	94.26553658	90.56316312	87.03988984	83.68599923	80.49235246
200421A00026	4/21/2020	1.34	4/19/2030	4/21/2020	103.94327	98.27478744	92.99048219	88.0615514	83.46151902	79.16603531	75.15269477	71.40087064	67.8915643
120807A00026	8/7/2012	2.42	8/9/2027	8/7/2012	104.27009	101.9005814	99.61468267	97.40873641	95.27927034	93.22298847	91.23676095	89.31761448	87.46272349
190205A00020	2/5/2019	3.32	2/5/2029	2/5/2019	115.01105	109.4109007	104.1419887	99.18260547	94.51258502	90.11318792	85.96699273	82.05779621	78.37052172
190305A00017	3/5/2019	3.12	3/5/2026	3/5/2019	107.35855	104.4154531	101.5732202	98.8277647	96.17518966	93.61178133	91.13399899	88.73846565	86.42195939

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
151120A00019	11/20/2015	2.72	11/20/2030	11/20/2015	109.5878	105.3970658	101.4389656	97.69817745	94.16050838	90.81280718	87.64288077	84.63941769	81.79191819
180402A00013	4/2/2018	2.99	4/3/2028	4/2/2018	111.08776	106.924568	102.967087	99.2036504	95.62332929	92.2158798	88.9716958	85.88176535	82.93763026
180713A00031	7/13/2018	3.06	7/14/2025	7/13/2018	102.81251	101.5078169	100.2326257	98.9860222	97.76713198	96.57511447	95.40916138	94.26849523	93.15236787
160908A00025	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503644	99.11886731	96.01243367	93.02547096	90.15267188	87.38899794	84.72966399	82.17012389
170407A00001	4/6/2017	2.97	4/6/2027	4/6/2017	109.36057	105.5868528	101.9762567	98.52070838	95.21258039	92.04466677	89.01015731	86.10261329	83.31594488
181003A00019	10/3/2018	3.44	10/3/2025	10/3/2018	107.37861	104.7008136	102.1054735	99.58951062	97.14998341	94.78408113	92.48911695	90.26252152	88.10183681
220308A00012	3/8/2022	2.51	3/8/2032	3/8/2022	112.88725	105.5630123	98.83579455	92.65189947	86.96279959	81.7246113	76.89762451	72.44588252	68.33680634
150320A00019	3/20/2015	2.25	3/20/2025	3/20/2015	103.11739	101.232781	99.39565929	97.60446733	95.8577095	94.15395193	92.49181931	90.86999196	89.28720302
150803A00038	8/3/2015	3.41	8/2/2030	8/3/2015	117.02738	110.5417529	104.5067915	98.88776933	93.65284311	88.77279908	84.22082155	79.97228296	76.00455356
160608A00019	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479035	99.50759742	96.57862658	93.75628973	91.03611028	88.41382428	85.88536915	83.44687303
190826A00032	8/26/2019	1.72	8/24/2029	8/26/2019	104.65879	101.2732041	98.04956127	94.97856496	92.05152064	89.26029622	86.59728176	84.05535239	81.62783409
191008A00007	10/8/2019	1.67	10/9/2029	10/8/2019	104.58472	101.1198159	97.82417121	94.68787594	91.7016785	88.85693646	86.14557214	83.56003193	81.09324858
200319A00035	3/19/2020	1.72	3/18/2033	3/19/2020	107.46546	101.2793209	95.58480479	90.33717053	85.49611897	81.02532368	76.89201187	73.06659211	69.52232327
200910A00006	9/10/2020	0.96	9/10/2027	9/10/2020	102.30926	98.10065336	94.09569629	90.28336847	86.65330793	83.19576927	79.90158329	76.76211955	73.76925152
190227A00033	2/27/2019	2.65	2/27/2026	2/27/2019	103.28532	101.6768712	100.1104967	98.5847511	97.09825237	95.64967619	94.23775313	92.86126592	91.51904691
190403A00010	4/3/2019	3.08	4/3/2029	4/3/2019	114.31908	108.4539272	102.9473572	97.77522273	92.91513455	88.34632724	84.04953253	80.0068632	76.20170658
160524A00028	5/24/2016	2.06	5/24/2023	5/24/2016	100.45741	100.0610184	99.66776769	99.27762416	98.89055097	98.50651194	98.12547144	97.74739438	97.37224625
160908A00035	9/8/2016	2.3	9/8/2031	9/8/2016	107.515	103.0120008	98.78081476	94.80207391	91.05795037	87.53202441	84.20916319	81.07541075	78.11788812
161229A00018	12/29/2016	2.46	12/29/2026	12/29/2016	104.01172	101.9726054	99.99725699	98.08315597	96.2279008	94.4292019	92.68487561	90.99283851	89.35110212
181129A00005	11/29/2018	3.21	11/29/2023	11/29/2018	101.83192	100.9334669	100.051036	99.18420265	98.332555	97.49569546	96.67324024	95.86481876	95.07007307
191112A00024	11/12/2019	2.09	11/12/2024	11/12/2019	102.1654	100.3753387	98.62590736	96.9159485	95.24434067	93.61000144	92.01188578	90.44898455	88.920323
180716A00062	7/16/2018	2.91	7/16/2025	7/16/2018	102.89021	101.5805761	100.3006361	99.04947216	97.82620155	96.62997607	95.45998018	94.31542947	93.19556924
160824A00019	8/24/2016	1.98	8/25/2031	8/24/2016	107.00357	102.5396935	98.34407091	94.39766733	90.68296004	87.18380466	83.88531698	80.77376554	77.83647418
170713A00021	7/13/2017	3.25	7/13/2037	7/13/2017	125.999	114.1958577	103.7995171	94.62575754	86.51590984	79.333155	72.95938056	67.29250572	62.24420336
181115A00044	11/15/2018	3.26	11/15/2023	11/15/2018	101.8029	100.9315795	100.075176	99.23330946	98.40561053	97.5917224	96.79130018	96.00401041	95.22953057
200317A00043	3/17/2020	1.29	3/15/2030	3/17/2020	103.39548	99.76771753	96.32650725	93.0604024	89.9587463	87.01161496	84.20976166	81.54456601	79.00798721
190708A00032	7/8/2019	2.58	7/2/2029	7/8/2019	111.59738	105.6482312	100.0761756	94.85499379	89.96042753	85.37002528	81.06299854	77.0200902	73.22345407
210217A00005	2/17/2021	0.83	2/14/2031	2/17/2021	101.78502	97.77829421	94.00013662	90.43510649	87.06892795	83.88839813	80.88129894	78.03631672	75.3429689
210212A00006	2/12/2021	0.77	2/12/2026	2/12/2021	100.46371	97.59631296	94.8275135	92.15334354	89.57001753	87.07392538	84.66162311	82.32982409	80.07539075
160705A00010	7/5/2016	1.68	7/5/2023	7/5/2016	100.35161	99.84353231	99.34062277	98.84280427	98.34999968	97.86213341	97.37913142	96.90092111	96.42743135
190708A00026	7/8/2019	2.21	7/1/2024	7/8/2019	101.7258	100.2778868	98.85823006	97.46607353	96.10068698	94.76136554	93.44742862	92.15821884	90.89310109
210423A00003	4/23/2021	1.31	4/23/2031	4/23/2021	103.85707	99.68684465	95.75876288	92.0561927	88.56377762	85.26733337	82.15375016	79.21090369	76.4275741
160307A00024	3/7/2016	2.17	3/6/2026	3/7/2016	102.23786	100.6118613	99.02902592	97.48785624	95.98691942	94.52484297	93.10031171	91.71206497	90.35889387

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200501A00009	5/4/2020	0.67	5/1/2025	5/4/2020	99.652212	98.47148474	97.31627332	96.18581354	95.07937036	93.99623676	92.93573242	91.89720249	90.8800164
151223A00036	12/23/2015	2.64	12/23/2025	12/23/2015	103.48279	101.6357651	99.84421186	98.10609522	96.41946344	94.78244878	93.19326331	91.65019494	90.15160375
190605A00023	6/5/2019	2.64	6/5/2029	6/5/2019	111.89557	105.991733	100.4582847	95.26973216	90.40247433	85.83464955	81.54599872	77.51773984	73.73245301
141015A00029	10/15/2014	2.32	10/15/2024	10/15/2014	102.48417	100.9304964	99.41023622	97.92241808	96.46610431	95.04039248	93.64441374	92.2773312	90.9383385
200406A00029	4/6/2020	1.61	4/5/2030	4/6/2020	105.99756	99.72222505	93.88547373	88.45388611	83.39677346	78.6859392	74.29546346	70.20150733	66.38213508
210809A00013	8/9/2021	1.05	8/7/2026	8/9/2021	101.67925	98.48857214	95.42023517	92.46882866	89.62921466	86.89651178	84.26608081	81.73351115	79.29460815
150414A00037	4/14/2015	2.34	4/14/2025	4/14/2015	101.62305	100.4573348	99.31630451	98.19922354	97.10538572	96.0341119	94.98474873	93.9566674	92.94926254
180717A00021	7/17/2018	3.34	7/17/2028	7/17/2018	113.48624	108.6239565	104.022388	99.66583857	95.53964549	91.63010728	87.92441555	84.41059189	81.07742963
150604A00039	6/4/2015	2.82	6/4/2030	6/4/2015	109.52241	105.5480747	101.7841666	98.2174231	94.83551916	91.62699816	88.58120483	85.68822357	82.93882204
200406A00032	4/6/2020	1.09	4/4/2025	4/6/2020	100.67533	98.55110053	96.48283588	94.46866829	92.50680423	90.59552446	88.73318028	86.91818995	85.14903538
221018A00007	10/18/2022	4.68	10/18/2027	10/18/2022	110.21713	107.6210653	105.1192835	102.7075525	100.3818612	98.13840702	95.9735834	93.88396823	91.86631323
131018A00006	10/18/2013	3.28	10/20/2025	10/18/2013	107.00092	104.4852195	102.0465671	99.68212979	97.38919592	95.16517018	93.00756788	90.91400944	88.88221528
140821A00030	8/21/2014	2.27	8/21/2024	8/21/2014	101.16977	100.3345477	99.51433777	98.70872701	97.91731699	97.13972413	96.37557904	95.6245258	94.88622137
170201A00016	2/1/2017	2.49	2/1/2024	2/1/2017	101.61549	100.5488042	99.50472086	98.48252788	97.4815405	96.50110228	95.54058363	94.59938049	93.67691303
150617A00018	6/17/2015	2.45	6/17/2025	6/17/2015	101.92032	100.6683595	99.44411025	98.24672538	97.07539473	95.92933929	94.80780969	93.71008487	92.63547073
170322A00033	3/22/2017	3.61	3/24/2042	3/22/2017	125.11987	114.0396173	104.3050648	95.72860404	88.15106907	81.43715647	75.47162071	70.15610602	65.40650389
190315A00017	3/15/2019	2.88	3/15/2034	3/15/2019	114.0862	107.975529	102.3268115	97.09934006	92.25636548	87.76468544	83.59427508	79.71795869	76.11111742
150617A00030	6/17/2015	2.91	6/16/2025	6/17/2015	104.87816	102.6350825	100.4545955	98.3345773	96.27299031	94.26787854	92.31736364	90.41964135	88.57297806
160413A00021	4/13/2016	2.48	4/13/2026	4/13/2016	105.76032	102.7297462	99.80638665	96.98581269	94.2638039	91.63633942	89.09958714	86.64989357	84.28377438
170619A00096	6/16/2017	2.79	6/16/2027	6/16/2017	109.55423	105.4576924	101.5480445	97.81566961	94.25150108	90.84698522	87.59404942	84.48507258	81.51285744
191004A00023	10/4/2019	2.02	10/4/2029	10/4/2019	108.3588	102.3512703	96.73781641	91.49013372	86.58210978	81.98964005	77.69046278	73.66400826	69.89126129
210611A00007	6/11/2021	0.61	6/11/2024	6/11/2021	99.361892	97.99425921	96.65245639	95.33581404	94.04368517	92.77544455	91.53048776	90.30823036	89.10810707
160608A00024	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479037	99.50759743	96.5786265	93.75628956	91.03611003	88.41382395	85.88536875	83.44687255
170317A00044	3/17/2017	3.11	3/17/2027	3/17/2017	109.75799	106.016268	102.4345163	99.00487648	95.7199291	92.57266268	89.55644863	86.6650179	83.89243916
191101A00004	11/1/2019	1.91	11/1/2029	11/1/2019	108.36357	102.7578297	97.51231519	92.60137525	88.00132841	83.6903033	79.64809086	75.85600954	72.29678192
160810A00029	8/10/2016	2.17	8/10/2026	8/10/2016	105.42482	102.1335685	98.96840321	95.92374753	92.99430375	90.17503908	87.46117073	84.84815185	82.3316585
180925A00116	9/25/2018	3.28	9/25/2028	9/25/2018	108.74156	105.6942399	102.7753601	99.97834585	97.29700518	94.72550743	92.25835961	89.8903845	87.61670039
190529A00061	5/29/2019	2.46	5/29/2026	5/29/2019	102.90982	101.1884142	99.51451013	97.88641313	96.30250079	94.76122042	93.26108552	91.80067245	90.37861732
150825A00008	8/25/2015	2.82	8/25/2025	8/25/2015	105.10172	102.6991344	100.3673046	98.10368399	95.9058331	93.77141707	91.69820061	89.6840429	87.72689292
180206A00048	2/6/2018	2.72	2/6/2023	2/6/2018	100.24616	100.1410943	100.0362641	99.93166363	99.82729214	99.72314885	99.61923298	99.51554378	99.41208047
200330A00047	3/30/2020	1.5	3/30/2035	3/30/2020	104.64389	98.61231149	93.07031307	87.97169164	83.27504752	78.94324631	74.94294606	71.24418017	67.81998892
210913A00014	9/13/2021	1.15	9/13/2028	9/13/2021	101.68249	98.84931759	96.13515841	93.53393527	91.03992847	88.64775087	86.3523263	84.14886944	82.03286724
110701A00011	7/1/2011	3.87	7/1/2026	7/1/2011	105.71686	103.8637192	102.0635346	100.3143671	98.61435993	96.96173771	95.35480226	93.79192873	92.27156188

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190131A00023	1/31/2019	3.02	1/30/2034	1/31/2019	114.76288	108.7017114	103.0928004	97.89678448	93.07808458	88.60451537	84.44693581	80.57893806	76.97657021
210714A00012	7/14/2021	1.12	7/14/2026	7/14/2021	101.90263	98.68984692	95.59938738	92.62590542	89.76431648	87.00978621	84.35771668	81.80373339	79.34367309
160104A00020	1/4/2016	2.47	1/4/2023	1/4/2016	100.03078	100.0169216	100.0030796	99.98925104	99.97543606	99.96163459	99.94784661	99.93407209	99.92031102
191009A00009	10/9/2019	1.8	10/9/2026	10/9/2019	102.08027	100.1698627	98.31699704	96.51946701	94.77516839	93.08209277	91.43832248	89.84202582	88.29145257
151229A00026	12/29/2015	2.28	12/29/2025	12/29/2015	102.49836	100.9855523	99.51080066	98.07283433	96.67043899	95.30244994	93.96774963	92.66526538	91.3939672
160412A00029	4/12/2016	2.48	4/14/2031	4/12/2016	107.99465	103.6781852	99.61139964	95.7771936	92.15978201	88.74458099	85.51810798	82.46789078	79.58238471
160923A00009	9/23/2016	2.24	9/23/2031	9/23/2016	107.23911	102.7474204	98.52690689	94.55823898	90.82362754	87.3066889	83.99232379	80.86660749	77.9166901
191112A00022	11/12/2019	2.36	11/13/2029	11/12/2019	110.55036	104.361259	98.58327207	93.18655786	88.14359942	83.42900999	79.0193576	74.89300498	71.02996333
171204A00024	12/4/2017	2.71	12/4/2024	12/4/2017	103.43476	101.5784949	99.76550678	97.99451939	96.26430616	94.57368449	92.92151393	91.30669433	89.72816414
200309A00081	3/9/2020	1.18	3/8/2030	3/9/2020	103.21768	97.13200846	91.46867093	86.19572346	81.2838158	76.70596388	72.4373467	68.45512162	64.7382565
150803A00033	8/3/2015	3.41	8/2/2030	8/3/2015	117.02738	110.5417529	104.5067915	98.88776933	93.65284312	88.77279911	84.22082159	79.97228301	76.00455362
151125A00037	11/25/2015	2.41	11/25/2025	11/25/2015	102.29148	100.8278083	99.40009887	98.00717983	96.64792269	95.32124447	94.02610548	92.76150722	91.52649045
160328A00038	3/28/2016	2.54	3/30/2026	3/28/2016	105.61387	102.7256281	99.93739087	97.24504538	94.64467443	92.13254833	89.70511447	87.35898753	85.09094036
181010A00025	10/10/2018	3.48	10/10/2030	10/10/2018	112.7125	108.4448724	104.4119234	100.5983306	96.98989171	93.57343883	90.33675565	87.26850214	84.35814551
190905A00021	9/5/2019	2.08	9/5/2029	9/5/2019	108.68885	102.7268719	97.15203801	91.93680516	87.05574537	82.48536826	78.20396292	74.19145377	70.42926875
200612A00004	6/12/2020	1.42	6/12/2040	6/12/2020	103.19354	94.67940998	87.12991269	80.41941671	74.44010577	69.09929106	64.31715173	60.02482981	56.16282162
160126A00004	1/26/2016	2.52	1/26/2026	1/26/2016	106.1732	103.2432626	100.4124907	97.67694202	95.03285697	92.47664772	90.00488924	87.6143109	85.30178846
181119A00008	11/19/2018	3.23	11/17/2023	11/19/2018	101.75282	100.9037914	100.0692964	99.24896058	98.44242344	97.64933661	96.86936343	96.10217842	95.34746684
190708A00029	7/8/2019	2.57	7/2/2029	7/8/2019	111.53707	105.5904783	100.0208387	94.80193664	89.90952274	85.32115364	81.01604847	76.97495721	73.18004023
160713A00015	7/13/2016	1.57	7/13/2026	7/13/2016	101.83953	100.0503629	98.31250308	96.62406634	94.98324767	93.38832155	91.8376378	90.32961774	88.8627506
220211A00010	2/11/2022	1.99	2/11/2025	2/11/2022	101.76137	100.1995024	98.67425565	97.18449358	95.72912307	94.30709362	92.91739529	91.55905684	90.23114385
180322A00044	3/22/2018	3.18	3/22/2033	3/22/2018	114.69101	109.067803	103.8361918	98.96425579	94.42295676	90.18585981	86.2288805	82.53005838	79.06935387
200605A00018	6/5/2020	0.91	6/5/2025	6/5/2020	100.39343	98.12430667	95.91894116	93.77518229	91.69096308	89.66429835	87.69328101	85.77607846	83.91092924
210512A00011	5/12/2021	1.16	5/12/2026	5/12/2021	101.853	98.78437215	95.82761101	92.97803828	90.23119665	87.5828379	85.02891198	82.5655567	80.18908797
171204A00009	12/4/2017	2.23	12/4/2024	12/4/2017	101.35208	100.3905448	99.44736583	98.52202774	97.6140337	96.72290538	95.8481821	94.98942	94.14619123
181226A00030	12/26/2018	2.91	12/26/2028	12/26/2018	107.95892	104.8055473	101.7899957	98.90496945	96.14361822	93.49950313	90.96656903	88.53911903	86.2117909
200103A00002	1/3/2020	2.07	1/3/2030	1/3/2020	109.40561	103.6377952	98.248357	93.2097735	88.49668129	84.08569808	79.95525733	76.08545762	72.45792524
170707A00007	7/7/2017	2.65	7/8/2024	7/7/2017	102.41718	100.9471761	99.50603083	98.0929643	96.70722231	95.34807726	94.01482699	92.70679361	91.4233225
180925A00013	9/25/2018	3.41	9/25/2028	9/25/2018	108.45554	105.4289668	102.5295472	99.75078763	97.08657544	94.53115369	92.0790978	89.72529418	87.46492024
190829A00039	8/29/2019	1.85	8/29/2034	8/29/2019	108.04587	102.0583483	96.53832988	91.44332722	86.73511091	82.37925072	78.34470882	74.60347928	71.1302683
191206A00005	12/6/2019	2.18	12/7/2026	12/6/2019	106.32193	102.6271061	99.08596299	95.6912665	92.43616303	89.3141563	86.31908679	83.44511245	80.68669069
200430A00027	4/30/2020	1.31	4/30/2035	4/30/2020	103.45055	97.45028214	91.93997733	86.87313388	82.20810816	77.90757034	73.93802374	70.26938102	66.87459008
200512A00013	5/12/2020	1.17	5/12/2027	5/12/2020	102.99338	99.03142683	95.2496911	91.63901168	88.19073662	84.89669586	81.74917197	78.74087273	75.86490561

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200716A00004	7/16/2020	0.97	7/16/2027	7/16/2020	102.30144	98.21588186	94.32288971	90.61231807	87.07460725	83.70075026	80.4822578	77.41112568	74.47980447
181218A00040	12/18/2018	3.23	6/18/2030	12/18/2018	110.27213	106.2887941	102.5156623	98.9395175	95.54808054	92.32993538	89.27446233	86.37177697	83.61267423
190905A00025	9/5/2019	2.08	9/5/2029	9/5/2019	108.68884	102.7268711	97.15203856	91.9368069	87.05574821	82.48537211	78.20396771	74.19145944	70.42927522
200327A00084	3/27/2020	1.1	3/27/2025	3/27/2020	100.64945	98.59819392	96.60022395	94.65376219	92.75710162	90.90860668	89.10670955	87.34990673	85.63675576
220801A00066	8/1/2022	2.93	7/30/2027	8/1/2022	111.67074	107.2857606	103.1073225	99.12449069	95.32697481	91.70508354	88.24968615	84.95217697	81.80444221
150729A00028	7/29/2015	2.25	7/29/2025	7/29/2015	102.01655	100.7175014	99.44794112	98.20695388	96.99366212	95.80722253	94.6468243	93.51168768	92.40106247
180305A00030	3/5/2018	3.12	3/5/2025	3/5/2018	104.91402	102.805227	100.7502155	98.74723159	96.79458873	94.89066901	93.03391978	91.22285036	89.45602906
180612A00012	6/12/2018	2.94	6/12/2023	6/12/2018	100.51336	100.2674353	100.0231901	99.78060794	99.53967012	99.30035827	99.06265429	98.82654038	98.591999
200413A00009	4/13/2020	0.77	4/13/2027	4/13/2020	100.67659	98.54409962	96.48266205	94.48931465	92.56124054	90.69576031	88.89032429	87.14250537	85.44999223
221012A00053	10/12/2022	4.66	10/11/2024	10/12/2022	103.37376	102.4382449	101.5201215	100.6188993	99.73410909	98.86529923	98.01203498	97.17389768	96.35048398
160523A00086	5/23/2016	2.2	5/26/2026	5/23/2016	105.53691	102.5176188	99.6074894	96.80194569	94.09662686	91.48737845	88.97024135	86.54144153	84.19738036
170921A00055	9/21/2017	2.82	9/21/2027	9/21/2017	110.25201	105.9205479	101.7959734	97.86713509	94.12354999	90.55535881	87.15328499	83.90859673	80.81307172
180104A00041	1/4/2018	3.08	1/4/2033	1/4/2018	121.0498	112.0941318	103.9454693	96.52457112	89.76046023	83.58951501	77.95466813	72.80469662	68.09359224
160210A00054	2/10/2016	1.78	2/10/2026	2/10/2016	101.86454	100.2804623	98.73777422	97.23505827	95.77095657	94.34416792	92.95344493	91.5975914	90.27545979
151013A00033	10/13/2015	2.23	10/14/2025	10/13/2015	101.94249	100.5260307	99.14364416	97.79422795	96.47672671	95.19012739	93.93345728	92.70578201	91.50620375
160603A00029	6/3/2016	2.18	6/3/2031	6/3/2016	107.78497	103.3719716	99.21962954	95.30974635	91.62554868	88.15156244	84.87350299	81.7781753	78.8533831
190813A00057	8/13/2019	1.9	8/13/2024	8/13/2019	101.43129	99.87742713	98.35518396	96.86365477	95.40196967	93.96929148	92.56481419	91.18776152	89.83738551
191203A00010	12/3/2019	2.21	12/3/2029	12/3/2019	109.64395	103.4533586	97.6771406	92.2849938	87.24899561	82.54340074	78.14446063	74.03025873	70.18056016
200406A00014	4/6/2020	1.33	4/6/2035	4/6/2020	104.9605	98.83263188	93.20724374	88.03648711	83.27752583	78.89197425	74.84540002	71.10688569	67.64864205
160115A00011	1/15/2016	2.18	1/15/2026	1/15/2016	102.09931	100.5570868	99.05428415	97.58957906	96.16169963	94.76942626	93.41158903	92.08706536	90.79477769
170124A00017	1/24/2017	2.82	1/23/2032	1/24/2017	111.36602	106.5034169	101.9452884	97.66918739	93.65450756	89.88232326	86.33524024	82.99726079	79.85366151
160608A00034	6/8/2016	2.44	6/9/2031	6/8/2016	107.95603	103.5583901	99.41955153	95.52150791	91.84765243	88.38266095	85.11238389	82.02374791	79.10466642
190131A00013	1/31/2019	3.48	1/31/2034	1/31/2019	123.818	113.968879	105.0798708	97.04895604	89.78560472	83.20941877	77.24894325	71.84062281	66.92788512
200406A00035	4/6/2020	1.05	4/4/2025	4/6/2020	100.53012	98.52109081	96.5643005	94.65801582	92.80057226	90.99037401	89.22589051	87.50565312	85.82825213
160203A00017	2/3/2016	2.07	2/3/2023	2/3/2016	100.16924	100.0724473	99.9758472	99.87943985	99.78322471	99.68720118	99.59136868	99.49572663	99.40027444
161116A00006	11/16/2016	2.39	11/16/2026	11/16/2016	103.33721	101.3605795	99.44452481	97.58669264	95.78483927	94.03682397	92.34060359	90.69422738	89.09583217
171219A00009	12/19/2017	2.3	12/19/2024	12/19/2017	101.49558	100.4926814	99.50931967	98.54494426	97.59902257	96.67104183	95.76050814	94.86694561	93.98989553
180717A00026	7/17/2018	3.24	7/16/2025	7/17/2018	105.98564	103.6079268	101.2985967	99.0552631	96.87563558	94.75751834	92.69880565	90.69747751	88.75159555
200110A00037	1/10/2020	2.32	1/10/2030	1/10/2020	110.42912	104.1236185	98.24546261	92.76300446	87.647108	82.87093919	78.40977243	74.24081423	70.34304252
161014A00026	10/14/2016	2.16	10/14/2031	10/14/2016	107.95918	103.3719285	99.06494868	95.01804228	91.21263921	87.6316515	84.25934439	81.08121947	78.0839087
170804A00005	8/4/2017	1.94	8/5/2024	8/4/2017	100.88584	100.0552055	99.23947308	98.43822988	97.65108147	96.87764816	96.11756418	95.37047712	94.63604727
191004A00019	10/4/2019	2.02	10/4/2029	10/4/2019	108.3588	102.3512704	96.73781618	91.49013318	86.58210895	81.98963897	77.69046146	73.66400673	69.89125956
170309A00042	3/9/2017	2.18	3/11/2024	3/9/2017	100.79357	100.1685138	99.55394021	98.94955868	98.35508872	97.77026062	97.19481493	96.628502	96.07108146

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200512A00021	5/12/2020	0.86	5/12/2025	5/12/2020	100.23441	98.02621282	95.87855039	93.78942529	91.75692199	89.77919872	87.85448429	85.98107485	84.15733103
140730A00037	7/30/2014	2.83	1/30/2024	7/30/2014	101.06133	100.5137191	99.97421571	99.44261879	98.91873511	98.40237804	97.89336733	97.39152879	96.89669404
141017A00022	10/17/2014	2.78	10/17/2024	10/17/2014	103.12136	101.4598381	99.83446582	98.24419745	96.68802269	95.16496862	93.67409801	92.21450767	90.7853269
170619A00095	6/16/2017	2.79	6/16/2027	6/16/2017	109.55423	105.4576947	101.5480455	97.81566928	94.25149956	90.84698258	87.59404573	84.48506792	81.51285186
191004A00022	10/4/2019	2.02	10/4/2029	10/4/2019	108.3588	102.351271	96.73781483	91.49013003	86.58210416	81.98963269	77.69045383	73.66399788	69.89124961
210611A00012	6/11/2021	1.02	6/11/2026	6/11/2021	101.48559	98.35754993	95.34609504	92.44623605	89.65322843	86.96255552	84.36991623	81.87121357	79.46254381
170406A00024	4/6/2017	2.61	4/8/2024	4/6/2017	101.8333	100.6065183	99.40679695	98.23323832	97.08498309	95.96120961	94.86113181	93.7839973	92.72908557
200323A00090	3/23/2020	1.55	3/23/2027	3/23/2020	102.1428	99.84587298	97.62875906	95.48801887	93.42038826	91.42276671	89.49220785	87.62591078	85.8212118
170524A00037	5/24/2017	2.46	5/24/2024	5/24/2017	101.87231	100.5489711	99.2498145	97.97422614	96.72161645	95.4914152	94.28307064	93.09604882	91.92983279
200303A00028	3/3/2020	1.54	3/4/2030	3/3/2020	105.09306	99.44664297	94.17726472	89.25702992	84.66027218	80.36336388	76.34454305	72.58375579	69.06251294
160414A00042	4/13/2016	2.48	4/13/2026	4/13/2016	105.76032	102.7297462	99.80638665	96.98581268	94.26380388	91.63633939	89.09958709	86.64989351	84.28377431
190802A00011	8/2/2019	2.01	8/2/2029	8/2/2019	105.66833	102.2502352	98.99558067	95.89498406	92.93967466	90.1214488	87.43262926	84.86602789	82.41491114
160629A00066	6/29/2016	2.61	6/30/2036	6/29/2016	118.32384	107.7900678	98.442686	90.13507127	82.7398001	76.14602148	70.25720283	64.98919419	60.26856431
200206A00027	2/6/2020	2.15	2/6/2030	2/6/2020	109.39655	103.0818349	97.19908347	91.71602533	86.60297466	81.83261146	77.37978079	73.22131007	69.33584275
140703A00026	7/3/2014	3.11	7/3/2024	7/3/2014	102.95673	101.5456873	100.1620942	98.80520871	97.47431894	96.16873789	94.88780239	93.63087203	92.39732824
160608A00023	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479035	99.50759741	96.57862657	93.75628971	91.03611026	88.41382425	85.88536912	83.44687299
170224A00009	2/24/2017	2.39	2/24/2023	2/24/2017	100.2722	100.117863	99.96400536	99.81062597	99.65772269	99.50529329	99.35333559	99.20184743	99.05082662
180913A00033	9/13/2018	3.31	9/13/2033	9/13/2018	116.09849	110.1418327	104.6177629	99.48958284	94.724042	90.29098469	86.16303894	82.3153385	78.7252745
150729A00041	7/29/2015	2.44	7/29/2025	7/29/2015	101.99355	100.6985123	99.43278834	98.19547456	96.98570059	95.80262985	94.64545798	93.51341129	92.40574537
180907A00013	9/7/2018	3.27	9/8/2025	9/7/2018	106.62549	104.055521	101.5629111	99.14482663	96.79855634	94.52150764	92.3112003	90.16526073	88.08141651
160908A00016	9/8/2016	1.87	9/8/2023	9/8/2016	100.51281	99.83585474	99.16811005	98.50938434	97.85949528	97.21826541	96.58552202	95.96109695	95.34482651
190620A00033	6/20/2019	2.1	6/20/2029	6/20/2019	105.84227	102.501209	99.31650651	96.27936246	93.38153847	90.61531927	87.973476	85.44923218	83.03623234
200309A00082	3/9/2020	1.18	3/8/2030	3/9/2020	103.21768	97.13200873	91.46867167	86.19572464	81.28381736	76.7059658	72.43734894	68.45512416	64.7382593
200309A00084	3/9/2020	1.06	3/9/2027	3/9/2020	102.38796	98.58821957	94.95535959	91.48109034	88.15758183	84.97743689	81.93366456	79.01965523	76.22915755
210212A00007	2/12/2021	0.76	2/12/2026	2/12/2021	100.41883	97.58887568	94.85588086	92.2159436	89.66534786	87.20054962	84.81816781	82.51497562	80.2878925
210512A00012	5/12/2021	1.16	5/12/2026	5/12/2021	101.853	98.78437219	95.82761133	92.97803886	90.23119747	87.58283896	85.02891327	82.5655582	80.18908967
160908A00023	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503643	99.1188673	96.01243379	93.0254712	90.15267223	87.38899838	84.72966454	82.17012452
190403A00014	4/3/2019	3.05	4/3/2029	4/3/2019	113.70574	108.032545	102.7025057	97.69263979	92.9816403	88.54973961	84.3785899	80.4511533	76.75160116
190712A00016	7/12/2019	2.39	7/12/2029	7/12/2019	106.15078	102.7733283	99.55511753	96.48712126	93.56089565	90.76853628	88.10264006	85.55627	83.12292269
200512A00001	5/12/2020	1.17	5/12/2027	5/12/2020	102.99338	99.03142687	95.24969105	91.63901156	88.19073643	84.89669562	81.74917167	78.74087238	75.86490522
201110A00003	11/10/2020	1.12	11/10/2027	11/10/2020	103.11283	98.74271513	94.59046966	90.6440511	86.89214202	83.32410471	79.92993697	76.70023099	73.62613505
120806A00015	8/6/2012	2.38	8/6/2027	8/6/2012	104.17294	101.8058416	99.52226329	97.31854909	95.19123098	93.13701698	91.15278102	89.23555338	87.38251184
160606A00018	6/6/2016	1.74	6/5/2026	6/6/2016	102.07897	100.3269983	98.62434141	96.96921436	95.35990758	93.79478586	92.27228454	90.79090588	89.34921579

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
191113A00013	11/13/2019	2.17	11/13/2026	11/13/2019	106.15421	102.5199058	99.03451728	95.69113901	92.48322447	89.4045631	86.44926131	83.61172464	80.88664102
150603A00032	6/3/2015	2.21	6/3/2025	6/3/2015	101.87565	100.6219517	99.39603685	98.19705547	97.02419471	95.87667299	94.75373852	93.65466791	92.57876488
160511A00016	5/11/2016	2.48	5/12/2031	5/11/2016	108.06527	103.704528	99.59822048	95.72878264	92.08000888	88.63693589	85.38573872	82.3136361	79.40880432
190910A00044	9/10/2019	2.02	9/10/2026	9/10/2019	105.26768	101.8066692	98.48199544	95.28748266	92.21727271	89.26580766	86.42781233	83.69827807	81.0724475
160211A00038	2/11/2016	1.83	2/11/2026	2/11/2016	101.60992	100.0347216	98.50057194	97.00606619	95.54986097	94.13066882	92.74725536	91.39843675	90.08307717
200318A00012	3/18/2020	1.68	3/18/2033	3/18/2020	107.21283	101.0423381	95.36224738	90.1279273	85.29917754	80.83976089	76.71698513	72.90133167	69.36612528
220310A00008	3/10/2022	2.22	3/10/2025	3/10/2022	103.0125	100.9238293	98.88873224	96.90544388	94.9722751	93.08760596	91.24988229	89.45761241	87.709364
160908A00030	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503643	99.1188673	96.01243379	93.02547119	90.15267221	87.38899837	84.72966452	82.1701245
160908A00028	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503644	99.1188673	96.01243369	93.025471	90.15267194	87.38899801	84.72966408	82.17012399
200221A00012	2/21/2020	2.14	2/21/2040	2/21/2020	109.6274	100.8339982	93.0213289	86.06366922	79.85285876	74.29568673	69.31169062	64.83129551	60.79423914
210331A00007	3/31/2021	1.25	3/31/2031	3/31/2021	102.64613	98.58529497	94.75736555	91.14651804	87.73813441	84.51870092	81.47571691	78.59761172	75.87366895
210915A00025	9/15/2021	1.09	9/15/2026	9/15/2021	101.91308	98.63364307	95.4827891	92.45469362	89.54383652	86.74498085	84.0531564	81.46364428	78.97196255
190905A00024	9/5/2019	2.08	9/5/2029	9/5/2019	108.68884	102.7268708	97.15203904	91.9368081	87.05575008	82.48537458	78.20397072	74.19146294	70.42927917
130206A00009	2/6/2013	2.83	2/7/2028	2/6/2013	109.26527	105.2831447	101.4927226	97.88340226	94.44523802	91.16889185	88.04559245	85.06709754	82.22565891
160401A00005	4/1/2016	2.02	4/3/2023	4/1/2016	100.30053	100.0423883	99.7855784	99.5300933	99.27592277	99.02305667	98.77148496	98.52119772	98.27218511
170106A00030	1/6/2017	2.39	1/6/2027	1/6/2017	103.96723	101.8885101	99.87581043	97.92649144	96.03803629	94.20804669	92.43423642	90.71442527	89.04653343
200206A00008	2/6/2020	1.64	2/6/2025	2/6/2020	102.02281	100.0618408	98.14963509	96.28464466	94.46538146	92.69041592	90.95837417	89.26793542	87.61782942
200406A00027	4/6/2020	1.31	4/5/2030	4/6/2020	105.05536	99.32202505	93.97680511	88.9906215	84.33674348	79.99058934	75.92954173	72.13277987	68.58112703
150714A00003	7/14/2015	3.76	7/12/2030	7/14/2015	113.51556	109.3414851	105.3907685	101.6491893	98.10354817	94.7415845	91.55190263	88.52390499	85.6477307
170619A00089	6/16/2017	2.79	6/16/2027	6/16/2017	109.55423	105.457694	101.5480452	97.81566938	94.25150003	90.84698339	87.59404686	84.48506934	81.51285357
151001A00023	10/1/2015	2.02	10/1/2025	10/1/2015	101.93648	100.5169886	99.13169251	97.77948881	96.45931532	95.17015276	93.91102261	92.68098513	91.47913751
170105A00012	1/5/2017	2.68	1/5/2024	1/5/2017	101.5088	100.5145818	99.54002235	98.58454237	97.64758411	96.72861138	95.82710854	94.94257951	94.07454686
201221A00022	12/21/2020	0.51	12/19/2025	12/21/2020	100.18593	97.53091352	94.96323074	92.47951248	90.07653798	87.75122891	85.50064218	83.3219632	81.21249946
150929A00076	9/29/2015	2.28	9/29/2025	9/29/2015	101.9384	100.5618273	99.21774178	97.90510411	96.62292069	95.37023751	94.14613819	92.94974218	91.78020307
151029A00008	10/29/2015	2.28	10/29/2025	10/29/2015	102.01764	100.598887	99.21430568	97.86279081	96.5432841	95.25476958	93.99627161	92.76685295	91.5656129
200110A00043	1/10/2020	2.32	1/10/2030	1/10/2020	110.42912	104.1236181	98.24546295	92.76300544	87.64710954	82.87094124	78.40977493	74.24081714	70.34304578
200414A00009	4/14/2020	0.82	4/14/2025	4/14/2020	99.822898	98.67913359	97.55958891	96.46354351	95.39030445	94.33920534	93.30960509	92.30088669	91.31245614
210714A00016	7/14/2021	0.75	7/12/2024	7/14/2021	99.587032	98.15414056	96.74947576	95.37226803	94.0217752	92.6972815	91.39809634	90.12355323	88.8730087
210809A00015	8/9/2021	1.06	8/7/2026	8/9/2021	101.77244	98.50795791	95.36951854	92.35152653	89.44867094	86.65590659	83.96843911	81.38171089	78.89138792
170802A00013	8/2/2017	2.5	8/2/2024	8/2/2017	102.33704	100.8035932	99.30098335	97.82833821	96.38482212	94.9696303	93.58198733	92.22114589	90.88638543
160329A00017	3/29/2016	2.48	3/30/2026	3/29/2016	105.43722	102.5529488	99.76855385	97.07992927	94.48316259	91.97452864	89.55047912	87.20763281	84.94276648
171207A00026	12/7/2017	2.93	12/7/2027	12/7/2017	111.51496	106.8546818	102.4275846	98.22066285	94.22170832	90.41925416	86.8025259	83.36139614	80.08634233
200311A00015	3/11/2020	1.26	3/11/2027	3/11/2020	103.18246	99.35498642	95.69569492	92.19622606	88.84868261	85.64560436	82.57994116	79.6450279	76.83456104

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
161102A00014	11/2/2016	1.99	11/2/2023	11/2/2016	100.67409	99.85051562	99.0405058	98.24373154	97.45986981	96.68860802	95.92964361	95.18268364	94.44744442
170309A00014	3/9/2017	2.58	3/9/2027	3/9/2017	104.59802	102.422097	100.3175344	98.2813928	96.31087982	94.40333778	92.5562362	90.76716481	89.033827
190506A00026	5/6/2019	3.03	5/4/2029	5/6/2019	114.12724	108.2014561	102.6422972	97.42486143	92.52607061	87.92452541	83.60037506	79.53519771	75.71189055
190913A00018	9/13/2019	2.11	9/11/2026	9/13/2019	102.6092	100.729475	98.90541298	97.13491288	95.41596636	93.7466555	92.12514796	90.54969259	89.0186152
170727A00003	7/27/2017	1.97	7/29/2024	7/27/2017	100.86121	100.0687934	99.29039596	98.52563445	97.77413918	97.03555425	96.30953685	95.59575665	94.89389521
160210A00051	2/10/2016	2.28	2/10/2031	2/10/2016	107.94808	103.695373	99.68522782	95.90125787	92.32831545	88.95239121	85.76052059	82.7406986	79.88180203
200109A00008	1/9/2020	1.95	1/9/2030	1/9/2020	105.76571	102.1364419	98.69006348	95.41555952	92.30266324	89.34180153	86.52404339	83.84105236	81.28504294
200220A00026	2/20/2020	2.22	2/21/2040	2/20/2020	110.35032	101.4947475	93.62682371	86.61994549	80.36518976	74.76868843	69.74941148	65.23729322	61.17164622
200724A00011	7/24/2020	1.41	7/26/2038	7/24/2020	104.92471	94.11422801	84.69831186	76.48098477	69.29527928	62.99877266	57.46983219	52.60445402	48.31359921
160908A00019	9/8/2016	1.87	9/8/2023	9/8/2016	100.51281	99.83585474	99.16811005	98.50938434	97.85949528	97.2182654	96.58552201	95.96109695	95.3448265
181116A00006	11/16/2018	3.18	11/17/2025	11/16/2018	103.44654	101.9661401	100.5220971	99.11321949	97.73836745	96.39644712	95.08640833	93.8072425	92.55798065
160812A00006	8/12/2016	2.16	8/12/2026	8/12/2016	105.83356	102.6407789	99.56920502	96.61348761	93.7685483	91.02956268	88.39194596	85.85133951	83.40359831
210408A00007	4/8/2021	1.05	4/8/2031	4/8/2021	102.74037	98.61597575	94.73103607	91.06910049	87.614986	84.3546684	81.27518568	78.36455002	75.61166767
220310A00010	3/10/2022	2.31	3/10/2027	3/10/2022	107.27739	103.3728176	99.6386554	96.0664591	92.64825606	89.37651365	86.2441122	83.24431983	80.37076889
150929A00087	9/29/2015	2.09	9/29/2025	9/29/2015	101.9629	100.5819719	99.23371793	97.917095	96.63110123	95.37477476	94.14719181	92.94746479	91.77474064
170313A00045	3/13/2017	3.22	3/15/2032	3/13/2017	112.433	107.464011	102.8099319	98.44727372	94.35449563	90.51183292	86.90113791	83.50573594	80.31029516
160802A00026	8/2/2016	1.84	8/2/2023	8/2/2016	100.46123	99.8786255	99.30280722	98.73366143	98.17107253	97.61492756	97.06511614	96.52153041	95.98406494
170317A00040	3/17/2017	2.74	3/18/2024	3/17/2017	101.89244	100.7089359	99.55323988	98.42437454	97.32141042	96.24346066	95.18967853	94.15925518	93.1514176
190205A00021	2/5/2019	3.32	2/5/2029	2/5/2019	115.01105	109.4109002	104.1419885	99.18260551	94.51258531	90.11318846	85.96699349	82.05779719	78.3705229
180206A00046	2/6/2018	2.72	2/6/2023	2/6/2018	100.24616	100.1410943	100.0362641	99.93166363	99.82729214	99.72314885	99.61923299	99.51554378	99.41208047
210809A00016	8/9/2021	0.66	8/9/2024	8/9/2021	99.518057	98.17672915	96.86210885	95.57343953	94.30999363	93.07107076	91.85599642	90.66412079	89.4948176
150701A00056	7/1/2015	2.34	7/1/2025	7/1/2015	102.12969	100.8315897	99.5628879	98.32267629	97.11008235	95.92426746	94.76442525	93.6297801	92.5195857
190813A00064	8/13/2019	1.9	8/13/2024	8/13/2019	101.43129	99.87742713	98.35518402	96.8636549	95.40196986	93.96929172	92.56481449	91.18776187	89.83738591
201029A00004	10/29/2020	1.49	10/29/2038	10/29/2020	105.68801	94.69825365	85.14270425	76.81734422	69.54872518	63.1892061	57.6129587	52.71261153	48.39642787
210714A00009	7/14/2021	0.75	7/12/2024	7/14/2021	99.584216	98.13779548	96.7199017	95.32975689	93.966611	92.62974062	91.31844779	90.03205887	88.76992351
190329A00067	3/29/2019	2.61	3/29/2024	3/29/2019	101.72925	100.5570437	99.41272827	98.29530902	97.20383837	96.13741295	95.09517104	94.07629018	93.07998495
160201A00016	2/1/2016	2.1	2/2/2026	2/1/2016	102.04554	100.4639548	98.92355653	97.42294071	95.96076029	94.53572421	93.14659458	91.79218413	90.47135373
160908A00024	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503643	99.11886729	96.01243376	93.02547114	90.15267215	87.38899828	84.72966442	82.17012438
181218A00089	12/18/2018	3.05	6/19/2023	12/18/2018	100.96636	100.5046048	100.0471403	99.59390737	99.14484728	98.69990228	98.25901574	97.82213204	97.38919659
200522A00009	5/22/2020	0.96	5/22/2030	5/22/2020	101.42041	97.59980568	93.98346366	90.55841716	87.31262119	84.23488334	81.31479772	78.54268442	75.90953398
200512A00018	5/12/2020	0.85	5/12/2025	5/12/2020	100.19223	98.04276449	95.9518265	93.91749712	91.93792812	90.01134251	88.13603129	86.31035049	84.53271826
150219A00016	2/19/2015	2.68	2/19/2025	2/19/2015	103.60414	101.6482615	99.74167523	97.88277969	96.07004158	94.30198937	92.5772102	90.89434707	89.2520961
161229A00019	12/29/2016	2.46	12/29/2026	12/29/2016	104.01172	101.9726053	99.997257	98.083156	96.22790085	94.42920198	92.68487571	90.99283864	89.35110226

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190205A00022	2/5/2019	3.32	2/5/2029	2/5/2019	115.01105	109.4109018	104.1419892	99.18260546	94.51258453	90.11318699	85.96699139	82.05779452	78.37051969
110719A00017	7/19/2011	3.68	7/20/2026	7/19/2011	105.36548	103.5174354	101.7222581	99.97800372	98.28281683	96.63492329	95.03262629	93.47430237	91.95839771
180302A00014	3/2/2018	2.69	3/2/2023	3/2/2018	100.18364	100.0976179	100.011829	99.92627459	99.84095372	99.75586533	99.67100844	99.58638206	99.50198519
160908A00032	9/8/2016	2.17	9/8/2026	9/8/2016	105.31394	102.0904254	98.99086128	96.00970154	93.14168665	90.3818243	87.72537398	85.16783254	82.70492077
200512A00020	5/12/2020	0.86	5/12/2025	5/12/2020	100.23441	98.02621255	95.87854971	93.78942423	91.75692055	89.77919692	87.85448214	85.98107236	84.15732822
201103A00005	11/3/2020	0.89	11/4/2030	11/3/2020	101.12611	97.28278808	93.65204686	90.21992606	86.97349597	83.90077298	80.99064375	78.2327959	75.61765479
190104A00034	1/4/2019	3.18	1/4/2029	1/4/2019	111.96036	107.3061841	102.9074896	98.74830868	94.81376729	91.09000708	87.56411044	84.22403135	81.05853162
191112A00023	11/12/2019	2.36	11/13/2029	11/12/2019	110.55036	104.3612597	98.58327171	93.18655647	88.14359709	83.42900681	79.01935365	74.89300032	71.02995803
160106A00042	1/6/2016	2.43	1/6/2026	1/6/2016	102.49311	100.9453127	99.43705591	97.96701423	96.53391273	95.13652881	93.77368968	92.44426994	91.14718928
180906A00032	9/6/2018	3.24	9/5/2025	9/6/2018	106.61932	104.0241606	101.5072041	99.06559072	96.69658208	94.39755912	92.16601613	89.99955491	87.89587931
191008A00014	10/8/2019	1.85	10/8/2026	10/8/2019	104.79813	101.2839205	97.91057224	94.67162343	91.56094523	88.57272543	85.70145008	82.9418862	80.28906571
110909A00006	9/9/2011	2.26	9/9/2026	9/9/2011	102.89811	101.0130154	99.18374021	97.40817462	95.68430508	94.01020857	92.38404793	90.80406734	89.26858817
150824A00050	8/24/2015	2.03	8/25/2025	8/24/2015	101.80073	100.4636626	99.15758078	97.88150649	96.63450451	95.41567648	94.22415907	93.05912237	91.91976825
200115A00013	1/15/2020	2.18	1/15/2030	1/15/2020	107.89659	102.7911844	98.0044413	93.51384038	89.29860129	85.33953581	81.61891675	78.12035832	74.82870701
160301A00012	3/1/2016	2.02	3/1/2023	3/1/2016	100.22693	100.0588135	99.89126454	99.72427627	99.5578459	99.39197065	99.22664778	99.06187456	98.89764827
161214A00034	12/14/2016	2.65	12/14/2026	12/14/2016	103.96903	101.9384651	99.971174	98.06466192	96.21655436	94.42458702	92.68659995	91.00053198	89.36441548
210512A00008	5/12/2021	0.66	5/10/2024	5/12/2021	99.433964	98.14489631	96.87885842	95.63528428	94.41362623	93.21335398	92.03395399	90.87492875	89.73579622
120517A00021	5/17/2012	1.85	5/17/2024	5/17/2012	100.66834	99.96118176	99.26611869	98.58282424	97.91098035	97.2502809	96.60043117	95.96114721	95.33215542
180322A00040	3/22/2018	3.16	3/21/2031	3/22/2018	114.07013	108.7048049	103.6905198	99.00070024	94.61099037	90.49905142	86.64438133	83.02815161	79.63305961
210714A00011	7/14/2021	0.75	7/12/2024	7/14/2021	99.584216	98.13779548	96.71990169	95.32975689	93.966611	92.62974062	91.31844778	90.03205887	88.76992351
160908A00027	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503645	99.11886731	96.01243362	93.02547086	90.15267173	87.38899774	84.72966375	82.1701236
190605A00024	6/5/2019	2.64	6/5/2029	6/5/2019	111.89556	105.9917318	100.4582845	95.26973296	90.40247605	85.83465212	81.54600207	77.51774393	73.73245778
150227A00011	2/27/2015	2.33	2/27/2025	2/27/2015	103.16464	101.323351	99.52758791	97.7758863	96.06684134	94.39910468	92.77138167	91.18242875	89.63105094
190308A00016	3/8/2019	3.18	3/8/2034	3/8/2019	122.13124	112.7596713	104.2892671	96.62467881	89.68129975	83.38399371	77.66598005	72.46785589	67.73673798
190813A00052	8/13/2019	2.24	8/13/2029	8/13/2019	109.62843	103.6739494	98.10286318	92.88812137	88.00472591	83.42956815	79.14127618	75.12007521	71.34765996
220104A00006	1/4/2022	1.76	1/4/2029	1/4/2022	107.44105	102.2687026	97.39943284	92.81354963	88.4927536	84.42002804	80.57954234	76.95656303	73.53737207
190515A00035	5/15/2019	2.82	2/15/2029	5/15/2019	112.65958	106.9628236	101.6087362	96.57461791	91.83939348	87.38349109	83.18872712	79.23820028	75.51619445
200330A00058	3/30/2020	1.49	3/29/2030	3/30/2020	104.81551	99.14379283	93.85368604	88.91673775	84.30678658	79.99976601	75.97352491	72.2076644	68.68338954
210107A00008	1/7/2021	0.54	1/5/2024	1/7/2021	99.356928	98.38037607	97.42316737	96.48473005	95.56451486	94.66199384	93.77665925	92.90802263	92.0556139
191209A00005	12/9/2019	2.22	12/10/2029	12/9/2019	108.9346	103.2661787	97.96533979	93.0056458	88.36270916	84.01402583	79.93881994	76.11790206	72.5335398
180104A00024	1/4/2018	2.98	1/4/2028	1/4/2018	111.50304	106.9014205	102.5310172	98.37882146	94.43262778	90.68098039	87.11312301	83.71895243	80.48897537
200309A00034	3/9/2020	0.96	3/9/2035	3/9/2020	102.62222	96.67004213	91.20306126	86.17533033	81.54569513	77.2772541	73.33688564	69.6948312	66.32432717
191004A00025	10/4/2019	1.74	10/4/2024	10/4/2019	101.38652	99.70434983	98.05846506	96.44777129	94.87121874	93.32779935	91.81654469	90.33652399	88.88684231

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200406A00037	4/6/2020	0.9	4/6/2023	4/6/2020	100.01144	99.74557586	99.48113849	99.21811333	98.95648903	98.69625437	98.43739827	98.17990974	97.92377791
150311A00003	3/11/2015	2.72	3/31/2025	3/11/2015	103.99442	101.9392564	99.93720859	97.986506	96.08545099	94.23241688	92.4258442	90.66423731	88.94616117
190605A00007	6/5/2019	2.47	6/5/2026	6/5/2019	106.25511	102.9988843	99.86339532	96.84350598	93.93432517	91.13119546	88.42968067	85.8255541	83.31478752
200110A00039	1/10/2020	2.32	1/10/2030	1/10/2020	110.42912	104.123618	98.24546308	92.76300582	87.64711016	82.87094207	78.40977595	74.24081833	70.34304714
210714A00013	7/14/2021	1.12	7/14/2026	7/14/2021	101.90263	98.68984676	95.59938624	92.62590335	89.76431352	87.00978242	84.35771209	81.80372804	79.34366701
210809A00012	8/9/2021	1.06	8/7/2026	8/9/2021	101.77244	98.50795787	95.36951828	92.35152607	89.44867028	86.65590574	83.96843808	81.38170969	78.89138656
150224A00010	2/24/2015	2.34	2/24/2025	2/24/2015	101.65832	100.478945	99.32739939	98.20276603	97.10417078	96.03077584	94.98177788	93.95640633	92.95392171
180718A00008	7/18/2018	3.37	7/18/2028	7/18/2018	114.88516	109.485601	104.3841337	99.56250558	95.00368111	90.69175426	86.61186756	82.75013745	79.0935854
190103A00020	1/3/2019	3.12	1/5/2026	1/3/2019	107.22339	104.3159639	101.505468	98.78811668	96.16029213	93.61853873	91.15955467	88.78018409	86.47740981
200818A00012	8/18/2020	0.97	8/18/2027	8/18/2020	102.31825	98.15979398	94.20038135	90.42935726	86.83669754	83.41296739	80.14928333	77.03727781	74.06906637
180813A00045	8/13/2018	2.89	8/13/2025	8/13/2018	102.97674	101.6243989	100.3033621	99.01264731	97.75131065	96.51844536	95.31318002	94.13467686	92.98213016
160209A00006	2/9/2016	1.91	2/9/2026	2/9/2016	101.73899	100.1618551	98.62580703	97.12944674	95.67142967	94.2504671	92.86532348	91.51481381	90.19780116
190205A00023	2/5/2019	3.32	2/5/2029	2/5/2019	115.01105	109.4109003	104.1419885	99.18260551	94.51258528	90.11318838	85.96699338	82.05779705	78.37052273
150617A00017	6/17/2015	2.27	6/17/2025	6/17/2015	101.95523	100.6992781	99.47120162	98.27014577	97.09529365	95.94585989	94.8210891	93.7202545	92.64265656
191203A00011	12/3/2019	2.21	12/3/2029	12/3/2019	109.64395	103.4533588	97.67714044	92.28499334	87.24899488	82.54339977	78.14445943	74.03025733	70.18055857
160413A00020	4/13/2016	2.48	4/13/2026	4/13/2016	105.76032	102.7297462	99.80638666	96.98581266	94.26380384	91.63633933	89.09958701	86.64989341	84.28377419
210611A00008	6/11/2021	0.61	6/11/2024	6/11/2021	99.358587	97.98303292	96.63347291	95.30923357	94.00966396	92.73413503	91.48203865	90.25278679	89.04581068
170309A00016	3/9/2017	2.39	3/8/2024	3/9/2017	100.92583	100.3003552	99.68535849	99.08054646	98.48563936	97.90036817	97.32447408	96.75770802	96.19983017
180905A00017	9/5/2018	3.43	9/6/2033	9/5/2018	125.34969	115.7036512	106.9703514	99.05555817	91.87536498	85.35500104	79.42778664	74.03421331	69.12113325
171013A00024	10/13/2017	2.47	10/15/2024	10/13/2017	102.63316	100.9552057	99.3137848	97.70783053	96.13631636	94.5982542	93.0926926	91.61871501	90.17543823
190702A00071	7/2/2019	2.69	7/1/2039	7/2/2019	119.8568	107.4574375	96.69801118	87.3402546	79.18250228	72.05383247	65.80918111	60.32525899	55.497136
190702A00068	7/2/2019	2.69	7/1/2039	7/2/2019	119.85681	107.4574401	96.69800676	87.3402444	79.18248731	72.05381356	65.80915898	60.32523423	55.49710911
151209A00024	12/9/2015	2.22	12/9/2025	12/9/2015	102.40222	100.8924184	99.42053051	97.9852977	96.58551236	95.22001607	93.88769723	92.58748877	91.31836603
160603A00014	6/3/2016	1.74	6/3/2026	6/3/2016	102.07872	100.3268753	98.62433841	96.96932246	95.36011849	93.79509183	92.2726783	90.79138065	89.34976521
160608A00025	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479035	99.50759741	96.57862664	93.75628987	91.03611049	88.41382456	85.88536949	83.44687343
160908A00031	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503643	99.1188673	96.01243375	93.02547111	90.1526721	87.38899822	84.72966434	82.17012429
191105A00012	11/5/2019	2.07	11/3/2034	11/5/2019	109.54103	103.3476385	97.64687223	92.39316784	87.54560178	83.06738604	78.92541819	75.08988345	71.53390244
120330A00013	3/30/2012	2.98	4/2/2024	3/30/2012	102.16939	100.9993288	99.85628164	98.73930513	97.6475021	96.58001644	95.53603072	94.51476403	93.51546996
140730A00035	7/30/2014	2.67	1/30/2023	7/30/2014	100.11201	100.0674954	100.023059	99.97869747	99.93441051	99.89019798	99.84605968	99.80199542	99.75800502
190813A00067	8/13/2019	1.9	8/13/2024	8/13/2019	101.43129	99.87742713	98.35518396	96.86365477	95.40196967	93.96929148	92.56481419	91.18776152	89.83738551
191015A00025	10/15/2019	2.01	10/15/2029	10/15/2019	105.01107	101.5473188	98.25220495	95.11588515	92.12916716	89.28346216	86.57074107	83.98349417	81.51469399
220310A00009	3/10/2022	2.31	3/10/2027	3/10/2022	107.27739	103.372818	99.63865542	96.06645879	92.64825543	89.37651271	86.24411098	83.24431833	80.37076713
150410A00021	4/10/2015	2.27	4/10/2025	4/10/2015	101.53887	100.3745545	99.23488126	98.1191177	97.0265586	95.95652575	94.90836675	93.88145372	92.87518222

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150803A00041	8/3/2015	3.01	8/2/2030	8/3/2015	109.58061	105.5382797	101.713335	98.09186978	94.6609775	91.40867342	88.32382244	85.39607302	82.61579653
190308A00026	3/8/2019	3.18	3/8/2034	3/8/2019	122.13124	112.7596712	104.2892671	96.62467882	89.68129982	83.38399383	77.66598021	72.46785609	67.73673822
170406A00026	4/6/2017	2.61	4/8/2024	4/6/2017	101.8333	100.6065183	99.40679696	98.23323834	97.08498312	95.96120965	94.86113186	93.78399736	92.72908565
170615A00006	6/15/2017	2.15	6/17/2024	6/15/2017	100.7465	100.0382478	99.34212326	98.65779414	97.98494162	97.32325887	96.67245042	96.03223168	95.40232836
181214A00030	12/14/2018	3.47	12/14/2033	12/14/2018	125.79113	115.8388602	106.8509789	98.72572419	91.37271001	84.71159421	78.67090849	73.18703056	68.20328034
190708A00028	7/8/2019	2.57	7/2/2029	7/8/2019	111.53707	105.5904777	100.0208386	94.80193717	89.90952378	85.32115517	81.01605044	76.9749596	73.18004301
200130A00046	1/30/2020	1.81	1/29/2027	1/30/2020	102.30866	100.2698215	98.2956118	96.38344835	94.53087113	92.7355358	90.99520739	89.30775445	87.67114351
160801A00002	8/1/2016	1.58	8/3/2026	8/1/2016	101.9226	100.091383	98.31359193	96.58723582	94.91040984	93.28129397	91.69814857	90.15931027	88.66318805
170406A00034	4/6/2017	3.01	4/6/2027	4/6/2017	109.99516	106.0430831	102.2643164	98.65021263	95.19260878	91.88379518	88.71648755	85.68380091	82.77922523
210412A00008	4/12/2021	0.66	4/12/2024	4/12/2021	99.406355	98.1858578	96.99131166	95.82188827	94.67679463	93.55527127	92.45659048	91.38005458	90.32499445
140924A00057	9/24/2014	3.25	9/25/2028	9/24/2014	115.28774	109.9403525	104.8939199	100.129582	95.62977389	91.37812634	87.35937738	83.55929113	79.96458298
170511A00011	5/11/2017	2.41	5/11/2027	5/11/2017	104.43554	102.1791715	99.99913541	97.8922133	95.85534267	93.88561189	91.98025162	90.13662687	88.35222956
191224A00002	12/24/2019	2.17	12/24/2029	12/24/2019	105.70307	102.133394	98.74119435	95.51590994	92.44769117	89.52734646	86.74629377	84.09651602	81.57052
151030A00026	10/30/2015	3.29	10/30/2030	10/30/2015	116.62465	109.9984631	103.8446429	98.12591051	92.80815064	87.86012519	83.25321549	78.96118897	74.9599877
160908A00026	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503644	99.11886731	96.01243371	93.02547104	90.15267199	87.38899808	84.72966416	82.17012409
180410A00002	4/10/2018	3.14	4/11/2033	4/10/2018	114.5708	108.910262	103.6467139	98.74757826	94.18323916	89.92675218	85.95358377	82.24137749	78.76974456
161012A00011	10/12/2016	1.53	10/12/2023	10/12/2016	100.35446	99.79375803	99.24026686	98.69383744	98.15432202	97.62157721	97.09546372	96.57584629	96.06259347
170619A00092	6/16/2017	2.79	6/16/2027	6/16/2017	109.55423	105.4576934	101.548045	97.81566949	94.25150045	90.84698411	87.59404786	84.48507061	81.51285508
180628A00068	6/28/2018	3.12	6/28/2028	6/28/2018	111.97573	107.6392931	103.5247696	99.61917526	95.91036559	92.38697604	89.03836765	85.85457655	82.82626732
190718A00012	7/18/2019	2.55	7/18/2029	7/18/2019	110.51851	105.0503519	99.9196177	95.10313364	90.57945371	86.32871954	82.33253429	78.57384727	75.03684827
210714A00018	7/14/2021	0.75	7/12/2024	7/14/2021	99.587032	98.15414055	96.74947576	95.37226802	94.02177518	92.69728148	91.39809632	90.12355321	88.87300868
221201A00043	12/1/2022	4.37	12/3/2029	12/1/2022	114.94938	110.8217604	106.9000821	103.1720914	99.62635875	96.25221786	93.03970939	89.97952925	87.06298106
170105A00010	1/5/2017	2.61	1/5/2027	1/5/2017	103.98946	101.9173488	99.91085251	97.9673573	96.08436829	94.25950774	92.49050867	90.77520895	89.11154571
200306A00058	3/6/2020	1.06	3/6/2030	3/6/2020	101.72866	98.17727078	94.80785	91.60926957	88.57116585	85.68388556	82.93843207	80.3264163	77.84001147
160608A00033	6/8/2016	2.44	6/9/2031	6/8/2016	107.95603	103.5583907	99.41955137	95.52150707	91.84765097	88.38265892	85.11238135	82.02374491	79.104663
161202A00001	12/2/2016	2.65	12/1/2023	12/2/2016	101.33363	100.430771	99.54413617	98.67328563	97.81779977	96.97727377	96.15131694	95.33955209	94.54161496
170207A00055	2/7/2017	2.36	2/8/2027	2/7/2017	104.00771	101.8861735	99.83312333	97.84577794	95.92149199	94.05774618	92.25214032	90.5023869	88.80630498
200317A00009	3/17/2020	1.61	3/16/2035	3/17/2020	105.33847	99.2667741	93.68786873	88.5552573	83.8272721	79.46653771	75.43949536	71.71598317	68.26886534
150925A00034	9/25/2015	2.36	9/25/2025	9/25/2015	102.05039	100.6725496	99.32720928	98.01333611	96.72993636	95.47605579	94.25077779	93.05322156	91.88254046
161004A00070	10/4/2016	1.92	10/4/2023	10/4/2016	100.57933	99.83137553	99.09461385	98.36879817	97.65368547	96.94903989	96.25463245	95.57024083	94.89564907
140618A00019	6/18/2014	3.08	6/18/2024	6/18/2014	101.50335	100.749883	100.0094723	99.28176544	98.56642069	97.86310884	97.17151284	96.49132713	95.82225712
191122A00003	11/22/2019	2.32	11/22/2039	11/22/2019	114.58697	103.4195937	93.66764273	85.13022205	77.63692484	71.04297917	65.22519847	60.07859669	55.51355551
171207A00024	12/7/2017	2.93	12/7/2027	12/7/2017	111.51496	106.854682	102.4275847	98.22066279	94.22170815	90.41925389	86.80252554	83.36139569	80.0863418

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180104A00023	1/4/2018	2.91	1/4/2028	1/4/2018	109.74141	105.7001101	101.8528572	98.18900203	94.69854271	91.37208209	88.20078774	85.17635485	82.29097174
200206A00034	2/6/2020	1.84	2/6/2025	2/6/2020	102.06791	100.0653689	98.11275523	96.20848472	94.35103431	92.53894068	90.77079744	89.04525241	87.3610051
200327A00094	3/27/2020	1.6	3/27/2030	3/27/2020	105.46255	99.76352702	94.44757682	89.48616219	84.85304154	80.52407292	76.47703428	72.69146006	69.14849268
150929A00083	9/29/2015	2.09	9/29/2025	9/29/2015	101.9629	100.5819719	99.23371793	97.917095	96.63110123	95.37477476	94.14719181	92.94746479	91.77474064
160608A00030	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479035	99.50759741	96.57862657	93.75628972	91.03611027	88.41382427	85.88536915	83.44687302
180628A00078	6/28/2018	2.73	6/28/2023	6/28/2018	100.51887	100.2661718	100.0152774	99.76616919	99.51882608	99.27322714	99.02935186	98.78718005	98.54669187
181128A00011	11/28/2018	3.27	11/28/2023	11/28/2018	101.88127	100.9850584	100.1047873	99.24003199	98.3903837	97.55544797	96.734844	95.92820403	95.1351728
151228A00013	12/28/2015	2.27	12/29/2025	12/28/2015	102.48292	100.9703559	99.49583708	98.05809775	96.65592381	95.28815074	93.95366116	92.65138255	91.38028511
160908A00036	9/8/2016	2.3	9/8/2031	9/8/2016	107.515	103.0120009	98.78081473	94.80207377	91.05795014	87.53202409	84.20916279	81.07541027	78.11788756
201207A00009	12/7/2020	1.01	12/7/2027	12/7/2020	102.68924	98.27345373	94.08090732	90.09909089	86.31625654	82.721372	79.30407335	76.05462114	72.96385959
190605A00027	6/5/2019	2.64	6/5/2029	6/5/2019	111.89557	105.9917349	100.4582848	95.26973063	90.40247132	85.83464518	81.54599311	77.5177331	73.73244524
210611A00011	6/11/2021	1.02	6/11/2026	6/11/2021	101.48559	98.35754991	95.34609496	92.44623589	89.65322821	86.96255524	84.36991589	81.87121317	79.46254335
160810A00025	8/10/2016	2.17	8/10/2026	8/10/2016	105.42482	102.1335685	98.96840322	95.92374757	92.99430382	90.17503918	87.46117086	84.84815201	82.33165868
200109A00006	1/9/2020	1.95	1/9/2030	1/9/2020	105.76572	102.1364433	98.69006294	95.41555717	92.30265919	89.34179592	86.52403632	83.84104395	81.28503327
150722A00033	7/22/2015	2.47	7/22/2025	7/22/2015	102.03178	100.7368407	99.47119872	98.23394898	97.02422228	95.84118318	94.68402831	93.55198497	92.44430964
160810A00030	8/10/2016	2.24	8/11/2031	8/10/2016	107.17934	102.7315325	98.54998105	94.61585735	90.9118233	87.42190027	84.13135282	81.02658315	78.09503518
160908A00017	9/8/2016	1.87	9/8/2023	9/8/2016	100.51281	99.83585474	99.16811004	98.50938433	97.85949527	97.21826539	96.58552199	95.96109693	95.34482648
171109A00016	11/9/2017	2.94	11/9/2032	11/9/2017	120.07846	111.1327211	102.9831126	95.55248797	88.77163156	82.57840539	76.91698866	71.73720282	66.99391191
180215A00034	2/15/2018	2.9	2/15/2023	2/15/2018	100.30923	100.1794271	100.0499737	99.9208686	99.79211053	99.66369801	99.53562963	99.40790397	99.28051963
180517A00024	5/17/2018	3.46	5/17/2033	5/17/2018	116.51689	110.7150259	105.3229579	100.3068325	95.63589154	91.28216904	87.22021711	83.42686042	79.8809762
150803A00042	8/3/2015	3.01	8/2/2030	8/3/2015	109.58061	105.5382796	101.713335	98.09186983	94.66097761	91.40867358	88.32382267	85.3960733	82.61579686
160428A00028	4/28/2016	2	4/28/2026	4/28/2016	102.38536	100.7090066	99.07818258	97.49128515	95.9467761	94.44318293	92.97909549	91.55316286	90.16409043
170619A00101	6/16/2017	2.74	6/16/2027	6/16/2017	108.87876	104.9738095	101.2443256	97.68135363	94.27644538	91.02162844	87.90937662	84.9325826	82.08453236
170406A00032	4/6/2017	3.01	4/6/2027	4/6/2017	109.99516	106.0430832	102.2643164	98.65021263	95.19260872	91.88379507	88.7164874	85.68380071	82.77922498
200414A00024	4/14/2020	1.37	4/14/2027	4/14/2020	103.72811	99.80735347	96.0620671	92.48341318	89.06304962	85.79309854	82.6661177	79.67507394	76.81331835
200623A00028	6/23/2020	1.23	6/23/2038	6/23/2020	104.12923	96.64640747	89.91041917	83.83534695	78.34607491	73.37683929	68.86998438	64.77489301	61.04706573
160608A00020	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479033	99.50759739	96.57862671	93.75629003	91.03611072	88.41382487	85.88536988	83.44687388
161014A00029	10/14/2016	2.51	10/15/2031	10/14/2016	109.60595	104.9478694	100.5743795	96.46497366	92.60079559	88.9644939	85.54009129	82.31286586	79.26924349
200330A00079	3/30/2020	1.51	3/30/2035	3/30/2020	104.7069	98.67165648	93.1262924	88.0245741	83.32507682	78.99064366	74.98791249	71.28689856	67.86062581
180420A00011	4/20/2018	2.74	4/20/2023	4/20/2018	100.35475	100.190769	100.027566	99.86513304	99.70346421	99.54255358	99.3823953	99.22298356	99.06431263
180605A00031	6/5/2018	3.37	6/5/2030	6/5/2018	110.83558	106.8320188	103.0396867	99.44530682	96.03654306	92.80192602	89.73078618	86.81319252	84.03989638
181128A00004	11/28/2018	3.08	11/28/2023	11/28/2018	101.88709	100.9886984	100.1063186	99.23952608	98.38790927	97.55107113	96.72862832	95.92021069	95.12546067
190104A00038	1/4/2019	3.25	1/4/2029	1/4/2019	114.49358	108.9827788	103.7943127	98.9072909	94.30228742	89.96123512	85.8673232	82.00490344	78.35940366

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200309A00083	3/9/2020	0.82	3/9/2023	3/9/2020	100.01559	99.82592499	99.63698968	99.4487807	99.26129382	99.07452486	98.88846966	98.70312409	98.51848407
130614A00018	6/14/2013	2.83	6/14/2023	6/14/2013	100.48747	100.2408438	99.99591212	99.75265677	99.5110588	99.27109957	99.03276074	98.79602424	98.56087229
150803A00037	8/3/2015	3.41	8/2/2030	8/3/2015	117.02738	110.5417529	104.5067915	98.88776933	93.65284312	88.77279912	84.22082159	79.97228302	76.00455363
180809A00034	8/9/2018	3.08	8/9/2023	8/9/2018	101.21867	100.6152861	100.0191548	99.43014762	98.84813704	98.27299853	97.70461056	97.14285441	96.58761419
170526A00017	5/26/2017	2.16	5/28/2024	5/26/2017	100.70587	100.0387928	99.38301729	98.73823209	98.10413745	97.48044501	96.86687727	96.26316707	95.66905708
190905A00019	9/5/2019	2.08	9/5/2029	9/5/2019	108.68884	102.7268711	97.15203853	91.93680681	87.05574809	82.48537194	78.20396751	74.1914592	70.42927495
181218A00086	12/18/2018	3.06	10/18/2023	12/18/2018	101.48055	100.70749	99.94648069	99.19724114	98.45949816	97.73298702	97.01745111	96.31264159	95.61831711
190403A00013	4/3/2019	3.05	4/3/2029	4/3/2019	113.70573	108.0325445	102.7025055	97.69263992	92.98164069	88.54974024	84.37859075	80.45115434	76.75160238
220407A00017	4/7/2022	3.16	4/6/2029	4/7/2022	113.7806	108.3047252	103.1554999	98.31122074	93.75174957	89.45839569	85.41380375	81.60185093	78.00755258
160907A00041	9/7/2016	1.83	9/7/2023	9/7/2016	100.48614	99.80901184	99.14107221	98.48213094	97.83200673	97.19052308	96.55750822	95.9327949	95.31622025
180809A00032	8/9/2018	3.08	8/9/2023	8/9/2018	101.21867	100.6152861	100.0191548	99.43014763	98.84813704	98.27299854	97.70461057	97.14285443	96.58761421
151223A00078	12/23/2015	2.28	12/23/2025	12/23/2015	102.49726	100.9849314	99.51062139	98.07306781	96.67105805	95.30342899	93.96906456	92.66689348	91.39588709
200413A00013	4/13/2020	1.19	4/12/2030	4/13/2020	102.22602	98.61705359	95.19486686	91.94792527	88.86549936	85.93760143	83.15492911	80.50881361	77.99117217
150213A00014	2/13/2015	2.41	2/13/2025	2/13/2015	101.77747	100.6892792	99.62322457	98.57866326	97.55497737	96.55157232	95.56787572	94.60333635	93.65742315
200709A00018	7/9/2020	0.59	7/7/2023	7/9/2020	99.787918	99.27604873	98.76945059	98.268042	97.7717434	97.28047687	96.79416605	96.31273614	95.83611381
201228A00013	12/28/2020	0.84	12/30/2030	12/28/2020	100.92546	97.05031461	93.39154827	89.93482067	86.66686195	83.57538144	80.6489886	77.87712075	75.24997717
160511A00015	5/11/2016	2.42	5/11/2026	5/11/2016	105.73527	102.6416685	99.65973657	96.78482892	94.01251729	91.33858058	88.75899402	86.26991895	83.86769325
161207A00014	12/7/2016	2.75	12/8/2031	12/7/2016	110.92946	106.1292215	101.6270866	97.40124513	93.43166669	89.69994222	86.18914133	82.88368292	79.76921795
200512A00017	5/12/2020	0.85	5/12/2025	5/12/2020	100.19223	98.0427647	95.95182698	93.91749785	91.93792911	90.01134374	88.13603275	86.31035218	84.53272018
150722A00035	7/22/2015	2.92	7/22/2025	7/22/2015	105.13125	102.8031239	100.5418938	98.34521501	96.21084145	94.13662019	92.12048708	90.16046242	88.25464688
150814A00029	8/14/2015	2.39	8/14/2025	8/14/2015	102.00718	100.6720096	99.36766882	98.09318908	96.84764304	95.63013974	94.43982283	93.27586895	92.13748618
160413A00016	4/13/2016	2.55	4/14/2031	4/13/2016	108.30336	103.974397	99.89583551	96.05052569	92.42263687	88.99754309	85.76172284	82.70266793	79.80880036
200306A00048	3/6/2020	1.04	3/6/2035	3/6/2020	103.12302	97.14161307	91.64776649	86.59531746	81.94291165	77.65346794	73.69370348	70.0337147	66.64660751
200306A00050	3/6/2020	0.87	3/6/2030	3/6/2020	101.83124	98.25954301	94.8714995	91.65584027	88.60207581	85.70043769	82.941824	80.31774922	77.82029825
190205A00019	2/5/2019	2.94	2/5/2024	2/5/2019	101.90394	100.8309997	99.78094522	98.75304501	97.74660095	96.76094399	95.79543271	94.84945187	93.92241109
210412A00007	4/12/2021	0.66	4/12/2024	4/12/2021	99.406355	98.18585778	96.99131164	95.82188824	94.67679459	93.55527123	92.45659042	91.38005452	90.32499438
190708A00025	7/8/2019	2.21	7/1/2024	7/8/2019	101.7258	100.2778868	98.85823007	97.46607354	96.100687	94.76136556	93.44742864	92.15821887	90.89310112
191031A00025	10/31/2019	1.91	10/31/2024	10/31/2019	100.79622	99.88347891	98.98776538	98.10859918	97.24552297	96.39809648	95.56589568	94.74851206	93.9455519
200206A00033	2/6/2020	2.15	2/6/2030	2/6/2020	109.39655	103.0818342	97.19908444	91.71602778	86.60297845	81.83261645	77.37978686	73.22131712	69.33585068
190104A00006	1/4/2019	2.83	1/5/2026	1/4/2019	103.12736	101.5696209	100.0516774	98.57219149	97.1298804	95.72351384	94.35191166	93.01394139	91.70851594
190501A00015	5/1/2019	2.78	5/1/2029	5/1/2019	107.31772	103.9869058	100.8096683	97.77747989	94.88235194	92.11679673	89.47379257	86.94675168	84.5294904
170921A00057	9/21/2017	2.79	9/21/2027	9/21/2017	109.60191	105.4774432	101.5468713	97.79983349	94.22658539	90.81795895	87.56532505	84.46055847	81.49600538
200311A00026	3/11/2020	1.34	3/11/2030	3/11/2020	104.11823	98.18608872	92.66039501	87.51060748	82.7086544	78.22871849	74.04704375	70.14175994	66.4927229

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
151118A00037	11/18/2015	2.75	11/18/2025	11/18/2015	104.94006	102.5543692	100.2419717	98.00016677	95.82637059	93.71810914	91.67301307	89.68881253	87.7633325
150812A00052	8/14/2015	2.13	8/14/2025	8/14/2015	101.93532	100.5972958	99.29024988	98.01320786	96.76523565	95.5454359	94.35294626	93.18693765	92.04661275
190404A00015	4/4/2019	2.88	4/3/2026	4/4/2019	107.16106	104.0360024	101.0215426	98.11309006	95.30627324	92.59693024	89.98109706	87.45499677	85.01502933
210714A00015	7/14/2021	1.11	7/14/2026	7/14/2021	101.80838	98.6673946	95.64519155	92.73659069	89.93667083	87.2407525	84.64438463	82.143332	79.73356354
161222A00013	12/22/2016	2.93	12/22/2026	12/22/2016	109.28179	105.7216189	102.307432	99.03236462	95.88991383	92.87391737	89.97853409	87.19822532	84.52773756
170406A00029	4/6/2017	3.01	4/6/2027	4/6/2017	109.99516	106.0430844	102.264317	98.65021256	95.19260807	91.88379387	88.71648567	85.6837985	82.77922231
190930A00026	9/30/2019	1.95	9/30/2024	9/30/2019	101.69046	100.0488577	98.44234381	96.86985237	95.33035906	93.8228811	92.34647508	90.900235	89.48329032
150603A00012	6/3/2015	2.77	6/3/2030	6/3/2015	109.32154	105.3546216	101.5977421	98.03765723	94.66206511	91.45953086	88.41941934	85.5318337	82.787559
190930A00028	9/30/2019	1.95	9/30/2024	9/30/2019	101.69046	100.0488577	98.44234394	96.86985262	95.33035944	93.8228816	92.3464757	90.90023573	89.48329117
210107A00010	1/7/2021	0.54	1/5/2024	1/7/2021	99.356928	98.38037619	97.42316756	96.48473031	95.56451519	94.66199424	93.77665971	92.90802315	92.05561448
160421A00016	4/21/2016	2.26	4/21/2026	4/21/2016	105.52796	102.583791	99.74346116	97.00269439	94.35741559	91.80374058	89.33796598	86.95655966	84.65615178
160810A00028	8/10/2016	2.19	8/10/2026	8/10/2016	105.638	102.2697169	99.03134894	95.91712513	92.92156941	90.03948009	87.26591436	84.59617379	82.02579072
190402A00005	4/2/2019	2.77	4/2/2032	4/2/2019	113.36222	107.2825668	101.6484719	96.42243994	91.57042478	87.06149094	82.86750877	78.96288134	75.32429957
160608A00027	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479035	99.50759741	96.57862661	93.75628981	91.0361104	88.41382444	85.88536934	83.44687325
160908A00037	9/8/2016	1.4	9/8/2023	9/8/2016	100.26092	99.76953274	99.28406707	98.80441407	98.33046376	97.86210898	97.39924534	96.94177108	96.48958701
181003A00032	10/3/2018	3.23	10/3/2025	10/3/2018	103.39646	101.9596869	100.5574407	99.1886052	97.85211092	96.54693122	95.27208041	94.02661175	92.80961558
190829A00032	8/29/2019	1.69	8/28/2026	8/29/2019	102.13229	100.2956558	98.51266972	96.78132908	95.09971839	93.46600758	91.87844758	90.33536611	88.83516378
160616A00029	6/16/2016	1.58	6/16/2026	6/16/2016	101.79354	100.0459767	98.34763677	96.69673687	95.09156928	93.53050063	92.01196803	90.53447557	89.09659091
180517A00018	5/17/2018	3.46	5/17/2033	5/17/2018	116.5169	110.7150282	105.3229589	100.3068323	95.63589027	91.28216682	87.22021406	83.42685663	79.88097177
191004A00017	10/4/2019	2.02	10/4/2029	10/4/2019	108.3588	102.3512714	96.73781387	91.49012782	86.58210083	81.98962834	77.69044857	73.66399178	69.89124276
191101A00005	11/1/2019	1.83	11/2/2026	11/1/2019	105.61969	102.0095873	98.54689108	95.22479419	92.03684037	88.97690338	86.03916831	83.21811419	80.50849762
200610A00006	6/10/2020	1.11	6/10/2027	6/10/2020	102.81583	98.79410439	94.95836009	91.29898378	87.8069065	84.47357314	81.29091062	78.25129818	75.34753975
150203A00027	2/3/2015	2.26	2/4/2030	2/3/2015	106.99435	103.280429	99.75555135	96.40822565	93.22774786	90.20414339	87.32811237	84.59097933	81.98464702
160906A00027	9/6/2016	2.03	9/8/2031	9/6/2016	107.29164	102.774606	98.53125975	94.54203135	90.78891718	87.25533993	83.92602546	80.78689102	77.82494383
190315A00029	3/15/2019	2.88	3/15/2034	3/15/2019	114.08621	107.9755331	102.3268128	97.09933868	92.25636166	87.76467936	83.59426692	79.7179486	76.11110553
220407A00014	4/7/2022	3.14	4/6/2029	4/7/2022	112.76856	107.6669533	102.8616459	98.33324858	94.06375766	90.03645052	86.23578704	82.64731918	79.25760804
180615A00021	6/15/2018	3.02	6/15/2023	6/15/2018	100.93645	100.4857538	100.0391501	99.59658446	99.15800194	98.72334866	98.29257171	97.86561911	97.44243982
190104A00035	1/4/2019	3.1	1/5/2026	1/4/2019	107.05147	104.1872711	101.4181883	98.74050869	96.15068879	93.64534371	91.22123901	88.87528318	86.60452034
170602A00019	6/2/2017	2.42	6/3/2024	6/2/2017	101.89482	100.5179395	99.16669405	97.84042366	96.53849453	95.26029382	94.00522886	92.7727263	91.56223136
190305A00015	3/5/2019	3.32	3/5/2029	3/5/2019	115.13339	109.4652326	104.1359014	99.12295425	94.40556311	89.9643896	85.7814701	81.84011046	78.12478942
210913A00015	9/13/2021	1.08	9/14/2026	9/13/2021	101.76246	98.61825518	95.59563839	92.68914167	89.89358252	87.20404295	84.61585421	82.12458244	79.7260153
150803A00036	8/3/2015	3.41	8/2/2030	8/3/2015	117.02738	110.541753	104.5067915	98.88776932	93.65284308	88.77279903	84.22082147	79.97228287	76.00455344
160210A00049	2/10/2016	1.78	2/10/2026	2/10/2016	101.86454	100.2804617	98.73777503	97.23506042	95.77096002	94.34417263	92.95345085	91.59759849	90.27546802

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
140917A00030	9/17/2014	3.23	9/17/2029	9/17/2014	115.34555	109.7034645	104.4119376	99.44657286	94.78482354	90.40584032	86.29033373	82.42044853	78.77964883
160711A00004	7/11/2016	1.51	7/13/2026	7/11/2016	101.72955	99.94238182	98.20647241	96.51993069	94.88095373	93.28781792	91.73887494	90.23254788	88.76732764
200608A00001	6/8/2020	1.34	6/7/2030	6/8/2020	103.96732	98.2111273	92.85123349	87.85747727	83.20216692	78.85986555	74.80719567	71.02266176	67.48648892
210423A00001	4/23/2021	1.72	4/23/2036	4/23/2021	107.73167	100.9633371	94.78951867	89.14974301	83.99028603	79.26336841	74.92644994	70.94161245	67.27501974
160427A00004	4/27/2016	2.09	4/27/2026	4/27/2016	102.18352	100.5158709	98.89339379	97.31449422	95.77765016	94.28140445	92.82436144	91.40518396	90.02259043
180309A00011	3/9/2018	3.19	3/10/2025	3/9/2018	105.10381	102.9793405	100.9093093	98.8919288	96.92548298	95.00832628	93.13887988	91.31562841	89.53711683
200110A00053	1/10/2020	1.99	1/10/2025	1/10/2020	102.24993	100.3119937	98.42128279	96.57634568	94.77578155	93.01824253	91.30243126	89.62709867	87.99104177
221014A00032	10/14/2022	4.67	10/14/2027	10/14/2022	117.8198	113.3876373	109.1651288	105.1410148	101.3047102	97.64625657	94.156281	90.82595853	87.64697693
160908A00033	9/8/2016	2.17	9/8/2026	9/8/2016	105.31394	102.0904253	98.99086128	96.00970159	93.14168674	90.38182444	87.72537415	85.16783275	82.70492102
210319A00009	3/19/2021	1.1	3/19/2026	3/19/2021	101.51964	98.58228521	95.74796327	93.01242233	90.37161676	87.82169403	85.35898404	82.97998915	80.68137481
201207A00021	12/7/2020	1.85	12/7/2050	12/7/2020	106.16265	93.39546847	82.7480405	73.81834835	66.28677966	59.89831246	54.44871037	49.77379434	45.74108216
200227A00046	2/27/2020	1.52	3/1/2027	2/27/2020	101.76	99.6917084	97.69004595	95.75231335	93.87594084	92.05848095	90.29760177	88.59108068	86.93679844
200806A00004	8/6/2020	0.3	3/6/2024	8/6/2020	99.608115	98.99212199	98.38643724	97.7907745	97.20485877	96.62842561	96.06122064	95.50299901	94.95352497
140318A00003	3/17/2014	3.08	3/18/2024	3/17/2014	102.51988	101.3322734	100.1725668	99.03978612	97.93299805	96.85131194	95.79387751	94.75988257	93.74855093
170829A00066	8/29/2017	2.11	8/29/2024	8/29/2017	102.17305	100.5702366	99.00065071	97.46331512	95.95729507	94.48169196	93.03564163	91.61831266	90.2289048
190911A00016	9/11/2019	1.9	9/11/2029	9/11/2019	105.34514	101.8959163	98.61341794	95.48797956	92.5105698	89.67274666	86.96661498	84.38478723	81.92034743
180126A00011	1/26/2018	2.72	1/26/2028	1/26/2018	106.11312	103.4789312	100.9448609	98.50622966	96.15861422	93.89782915	91.7199123	89.62111138	87.59787139
200512A00014	5/12/2020	1.17	5/12/2027	5/12/2020	102.99338	99.03142686	95.24969091	91.63901128	88.19073603	84.8966951	81.74917103	78.74087164	75.86490438
210915A00023	9/15/2021	0.74	9/16/2024	9/15/2021	99.626331	98.01818227	96.44398959	94.90273633	93.39344642	91.91518263	90.46704455	89.04816679	87.65771724
151204A00011	12/4/2015	2.28	12/4/2025	12/4/2015	102.4938	100.9829635	99.51005133	98.07380516	96.67301759	95.30653042	93.97323218	92.67205593	91.40197712
200709A00019	7/9/2020	0.77	7/9/2025	7/9/2020	100.11356	97.76881345	95.49210844	93.28106972	91.13341816	89.04696838	87.0196242	85.04937437	83.13428862
150824A00033	8/24/2015	2.22	8/25/2025	8/24/2015	101.7772	100.4443057	99.14221326	97.86995598	96.62660639	95.41127337	94.22310046	93.06126427	91.92497287
210512A00009	5/12/2021	0.66	5/10/2024	5/12/2021	99.433964	98.14489629	96.87885839	95.63528424	94.41362618	93.21335392	92.03395391	90.87492867	89.73579612
161014A00019	10/14/2016	2.39	10/15/2031	10/14/2016	107.99655	103.4316825	99.1446713	95.11556286	91.32600087	87.75908967	84.39926762	81.2321922	78.24463583
190708A00030	7/8/2019	2.57	7/2/2029	7/8/2019	111.53707	105.5904783	100.0208387	94.80193666	89.90952279	85.32115372	81.01604857	76.97495733	73.18004036
190510A00049	5/10/2019	2.58	5/8/2026	5/10/2019	103.02368	101.341547	99.70497753	98.11237195	96.56219469	95.05297558	93.58330651	92.15183834	90.75727803
200424A00022	4/24/2020	1.39	4/24/2030	4/24/2020	104.24002	98.55013664	93.24637787	88.29976834	83.68367063	79.37358763	75.34697941	71.5830966	68.06282888
160608A00021	6/8/2016	1.91	6/8/2023	6/8/2016	100.42409	99.98893439	99.55758421	99.12998628	98.70609163	98.28585216	97.86922058	97.45615043	97.04659603
190605A00025	6/5/2019	2.64	6/5/2029	6/5/2019	111.89557	105.9917331	100.4582847	95.26973209	90.40247422	85.83464939	81.54599852	77.51773961	73.73245275
180125A00027	1/25/2018	2.69	1/24/2025	1/25/2018	102.05728	100.8743959	99.71639978	98.58256289	97.47218192	96.38458001	95.31910557	94.27513111	93.25205212
210714A00010	7/14/2021	0.75	7/12/2024	7/14/2021	99.584216	98.13779533	96.71990142	95.32975649	93.96661048	92.62973999	91.31844704	90.03205801	88.76992254
190118A00006	1/18/2019	3.14	1/18/2034	1/18/2019	115.49443	109.3945877	103.7498508	98.52061163	93.67107058	89.16884246	84.98460487	81.09178528	77.46628214
160504A00022	5/4/2016	2	5/4/2023	5/4/2016	100.37833	100.0360502	99.69611511	99.35849965	99.02318013	98.69013319	98.35933574	98.03076504	97.70439863

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190813A00051	8/13/2019	2.19	8/13/2029	8/13/2019	109.32463	103.3833732	97.82474488	92.62174495	87.74942256	83.18471284	78.90628449	74.89440041	71.13079034
191004A00026	10/4/2019	1.74	10/4/2024	10/4/2019	101.38652	99.70434983	98.05846496	96.44777111	94.87121847	93.32779899	91.81654425	90.33652348	88.88684171
210107A00009	1/7/2021	0.54	1/5/2024	1/7/2021	99.356928	98.38037615	97.4231675	96.48473022	95.56451508	94.66199411	93.77665955	92.90802297	92.05561429
170406A00036	4/6/2017	3.07	4/6/2032	4/6/2017	111.77872	106.7966319	102.1327609	97.76319433	93.666019	89.82114103	86.21012184	82.81602977	79.62330598
200406A00030	4/6/2020	1.61	4/5/2030	4/6/2020	105.99756	99.72222498	93.88547308	88.45388494	83.39677181	78.68593713	74.29546099	70.20150452	66.38213195
200406A00036	4/6/2020	1.09	4/4/2025	4/6/2020	100.67533	98.55110064	96.48283623	94.46866886	92.50680502	90.59552548	88.7331815	86.91819137	85.149037
140428A00015	4/28/2014	2.35	4/29/2024	4/28/2014	100.96792	100.2975188	99.6385181	98.99060249	98.3534683	97.72682349	97.1103871	96.50388865	95.90706768
160413A00033	4/13/2016	2.32	4/13/2026	4/13/2016	104.54099	101.8844069	99.31808673	96.83837088	94.44177519	92.12497829	89.88481293	87.71825776	85.62242959
200206A00032	2/6/2020	2.15	2/6/2030	2/6/2020	109.39655	103.0818352	97.1990831	91.71602432	86.60297306	81.83260933	77.37977817	73.22130701	69.33583929
210714A00014	7/14/2021	1.12	7/14/2026	7/14/2021	101.90263	98.68984693	95.59938737	92.62590538	89.76431641	87.00978612	84.35771658	81.80373327	79.34367295
161227A00073	12/27/2016	2.83	12/28/2026	12/27/2016	108.02633	104.8001905	101.7023022	98.72672347	95.86782141	93.1202562	90.47896425	87.93914224	85.49623222
190926A00002	9/30/2019	2.01	9/29/2034	9/30/2019	109.07715	102.9912022	97.383431	92.21011507	87.43194298	83.01353235	78.92300689	75.13162175	71.61343144
200110A00038	1/10/2020	2.32	1/10/2030	1/10/2020	110.42912	104.1236179	98.24546306	92.76300587	87.64711026	82.87094222	78.40977616	74.24081859	70.34304744
200116A00012	1/16/2020	2.16	1/19/2027	1/16/2020	106.47953	102.6799313	99.04234741	95.5589559	92.22235627	89.02554456	85.96188987	83.0251123	80.20926242
200406A00033	4/6/2020	1.09	4/4/2025	4/6/2020	100.67533	98.55110063	96.48283621	94.46866884	92.506805	90.59552544	88.73318146	86.91819133	85.14903695
171219A00067	12/19/2017	2.72	12/20/2027	12/19/2017	110.67837	106.3156629	102.1677721	98.22276551	94.46944297	90.89728549	87.49640992	84.25752713	81.17190313
180913A00062	9/13/2018	3.05	9/13/2023	9/13/2018	101.33956	100.6478344	99.96568081	99.29290036	98.6293	97.97469201	97.32889376	96.69172757	96.06302049
190322A00008	3/22/2019	2.64	3/20/2026	3/22/2019	103.02526	101.3852155	99.7887432	98.23433084	96.72053045	95.24595512	93.80927593	92.40921912	91.04456331
150615A00024	6/15/2015	2.26	6/16/2025	6/15/2015	101.94222	100.6865252	99.45869619	98.25787948	97.08325855	95.93404836	94.80949386	93.70886856	92.63147321
160209A00008	2/9/2016	2.45	2/10/2031	2/9/2016	107.72308	103.5005518	99.51798854	95.75923113	92.20933768	88.85448582	85.68188102	82.67967292	79.83687905
190315A00019	3/15/2019	2.88	3/15/2034	3/15/2019	114.08621	107.9755299	102.3268118	97.09933976	92.25636465	87.76468412	83.5942733	79.71795649	76.11111482
191011A00027	10/11/2019	1.84	10/11/2029	10/11/2019	105.19045	101.7050623	98.38993696	95.23510627	92.23126355	89.36971482	86.64233431	84.04152339	81.56017274
200616A00005	6/16/2020	0.74	6/17/2030	6/16/2020	101.36921	97.69475008	94.21491416	90.91742428	87.79087775	84.82467567	82.00896072	79.33456016	76.79293349
210611A00009	6/11/2021	0.61	6/11/2024	6/11/2021	99.361892	97.99425924	96.65245644	95.33581412	94.04368528	92.77544468	91.53048791	90.30823053	89.10810726
140717A00027	7/17/2014	3.14	7/17/2026	7/17/2014	107.92156	104.8241073	101.8410289	98.9673968	96.19852257	93.5299468	90.95742659	88.47692364	86.08459314
200512A00011	5/12/2020	1.48	5/10/2030	5/12/2020	105.17822	98.87377374	93.01524269	87.56832272	82.5015256	77.78593648	73.39499111	69.30427325	65.49133068
221209A00070	12/9/2022	4.42	12/9/2037	12/9/2022	130.63787	121.446963	113.1511611	105.6498881	98.85492838	92.68880381	87.08337645	81.97864298	77.32169332
200428A00009	4/28/2020	1.08	4/29/2030	4/28/2020	101.81436	98.21969272	94.81111116	91.57712153	88.50703017	85.59088448	82.81941457	80.18398202	77.67653257
160303A00035	3/3/2016	2.14	3/3/2026	3/3/2016	102.19599	100.5701455	98.98842047	97.44924927	95.95113554	94.49264761	93.07241504	91.68912561	90.34152228
160810A00027	8/10/2016	2.13	8/10/2026	8/10/2016	105.04435	101.8873584	98.8497973	95.92641363	93.11222045	90.40247921	87.7926858	85.27855748	82.85602057
180206A00045	2/6/2018	2.71	2/6/2023	2/6/2018	100.24475	100.1398446	100.0351735	99.93073172	99.82651852	99.72253312	99.61877475	99.51524264	99.41193603
181105A00015	11/5/2018	3.57	11/5/2025	11/5/2018	108.02186	105.248975	102.5639098	99.96341007	97.44435694	95.00376384	92.63876998	90.34663439	88.12473023
160119A00072	1/19/2016	2.77	1/21/2031	1/19/2016	109.07449	104.7204345	100.6237083	96.76639295	93.13196128	89.70516278	86.47191583	83.41920993	80.53501668

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160908A00034	9/8/2016	2.17	9/8/2026	9/8/2016	105.31394	102.0904253	98.99086128	96.0097016	93.14168676	90.38182447	87.72537419	85.1678328	82.70492107
200212A00013	2/12/2020	1.98	2/12/2027	2/12/2020	105.90582	102.0647451	98.38962708	94.87234853	91.50523442	88.28102706	85.19286091	82.23423901	79.39901107
210319A00008	3/19/2021	0.63	3/19/2024	3/19/2021	99.362126	98.20052715	97.06633179	95.95857608	94.87634129	93.81875086	92.78496804	91.7741936	90.78566378
140908A00080	9/8/2014	2.51	3/8/2024	9/8/2014	101.63229	100.5813933	99.55389867	98.54901306	97.56598219	96.6040853	95.66263327	94.74096689	93.83845526
170524A00027	5/24/2017	2.32	5/24/2027	5/24/2017	104.23053	101.9780235	99.8017614	97.69852379	95.66524998	93.69903009	91.79709656	89.9568162	88.17568274
160404A00019	4/4/2016	2.48	4/4/2031	4/4/2016	107.99424	103.6780696	99.61152818	95.77752696	92.16028558	88.74522441	85.51886465	82.46873751	79.58330131
160608A00022	6/8/2016	1.91	6/8/2023	6/8/2016	100.42409	99.98893439	99.55758422	99.1299863	98.70609166	98.2858522	97.86922062	97.45615048	97.04659609
160908A00022	9/8/2016	2.21	9/8/2026	9/8/2016	105.71282	102.3503643	99.11886731	96.01243379	93.02547119	90.15267221	87.38899836	84.72966451	82.17012449
150427A00014	4/27/2015	2.98	4/27/2035	4/27/2015	114.30598	107.6712737	101.5782224	95.97542785	90.81685852	86.06125077	81.67157762	77.61458029	73.86035485
150803A00039	8/3/2015	3.01	8/2/2030	8/3/2015	109.58061	105.5382775	101.7133342	98.09187024	94.66097916	91.40867619	88.32382626	85.39607782	82.61580225
190129A00073	1/29/2019	3.11	1/29/2029	1/29/2019	107.99984	104.8159641	101.7724297	98.86175309	96.07690736	93.41129051	90.8586967	88.41328981	86.06957891
211007A00005	10/7/2021	0.86	10/7/2024	10/7/2021	99.874581	98.21176567	96.5849634	94.99309757	93.43513433	91.91008031	90.41698059	88.95491681	87.5230054
160719A00026	7/19/2016	1.87	7/20/2026	7/19/2016	102.00965	100.2226543	98.48678379	96.80015743	95.16098074	93.56753804	92.01818838	90.51136177	89.04555558
210212A00004	2/12/2021	1.1	2/12/2036	2/12/2021	103.46027	97.03823518	91.17410485	85.81172842	80.9011603	76.39792544	72.26237635	68.45913002	64.95657454
120808A00006	8/8/2012	2.06	8/9/2027	8/8/2012	103.90627	101.5367903	99.25116861	97.04572729	94.91697459	92.86159654	90.87644665	88.95853632	87.10502577
160608A00028	6/8/2016	2.36	6/8/2026	6/8/2016	105.70448	102.5479035	99.50759742	96.57862657	93.75628972	91.03611026	88.41382426	85.88536913	83.446873
180403A00014	4/3/2018	3.11	4/3/2025	4/3/2018	105.11444	102.9290382	100.8009546	98.72826922	96.70914646	94.74182681	92.82462314	90.95591699	89.13415516
190502A00016	5/2/2019	2.87	5/1/2026	5/2/2019	107.32815	104.1321805	101.0516173	98.08167352	95.21778948	92.45561744	89.79101072	87.22001327	84.73884993
210915A00026	9/15/2021	1.1	9/15/2026	9/15/2021	102.01488	98.65780574	95.43329903	92.33533345	89.3581979	86.49647495	83.74502367	81.09896374	78.55366042
180913A00012	9/13/2018	3.31	9/13/2033	9/13/2018	116.09848	110.1418308	104.6177621	99.48958318	94.72404327	90.29098678	86.16304176	82.31534196	78.72527853
160413A00014	4/13/2016	2.55	4/14/2031	4/13/2016	108.30336	103.974397	99.89583552	96.05052563	92.42263675	88.99754291	85.76172261	82.70266766	79.80880004
170301A00031	3/1/2017	2.11	3/1/2024	3/1/2017	100.70798	100.1212821	99.54389729	98.9755789	98.4160897	97.86520113	97.32269296	96.78835289	96.26197616
170317A00039	3/17/2017	2.73	3/18/2024	3/17/2017	101.86791	100.6926459	99.54492853	98.42379748	97.3283328	96.25765667	95.21093095	94.18735503	93.18616367
170406A00033	4/6/2017	3.01	4/6/2027	4/6/2017	109.99516	106.0430824	102.2643161	98.65021265	95.19260912	91.88379581	88.71648846	85.68380208	82.77922665
190905A00023	9/5/2019	2.08	9/5/2029	9/5/2019	108.68884	102.726871	97.15203865	91.93680714	87.0557486	82.48537263	78.20396835	74.19146018	70.42927606
221228A00129	12/28/2022	4.11	12/28/2027	12/28/2022	118.39015	113.4255295	108.7115037	104.2339456	99.9795992	95.93602342	92.09153778	88.4351718	84.95661804
191203A00009	12/3/2019	2.21	12/3/2029	12/3/2019	109.64395	103.4533592	97.67714006	92.28499224	87.24899314	82.54339743	78.14445657	74.03025399	70.1805548
170112A00015	1/12/2017	2.32	1/12/2027	1/12/2017	103.81988	101.7438651	99.73380071	97.78704864	95.90109405	94.07354056	92.30210383	90.58460548	88.91896747
200326A00032	3/26/2020	1.49	3/26/2030	3/26/2020	103.32488	99.71621654	96.29250955	93.04243786	89.95546449	87.02177498	84.23222285	81.57827953	79.05198836
160212A00006	2/12/2016	1.57	2/13/2023	2/12/2016	100.08351	100.0114221	99.93949479	99.86772813	99.79612156	99.72467452	99.65338646	99.58225681	99.51128502
161005A00016	10/5/2016	2.32	10/6/2031	10/5/2016	107.6699	103.1192392	98.84554615	94.82893315	91.0511044	87.4952198	84.1457687	80.98845551	78.01009577
200306A00057	3/6/2020	0.92	3/8/2027	3/6/2020	102.47303	98.83850686	95.36140962	92.03396708	88.84883729	85.79908288	82.87814619	80.07982611	77.39825649
190205A00017	2/5/2019	3.36	2/5/2029	2/5/2019	115.23548	109.6264403	104.3491137	99.38176202	94.70419201	90.2976387	86.14465686	82.22902107	78.53563398

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
190925A00009	9/25/2019	2	9/25/2026	9/25/2019	104.99044	101.6534712	98.4472621	95.36587964	92.40369558	89.55537182	86.81584342	84.18030273	81.64418454
200512A00010	5/12/2020	1.48	5/10/2030	5/12/2020	105.17822	98.87377408	93.01524406	87.56832502	82.50152874	77.78594039	73.3949957	69.30427846	65.49133644
210915A00024	9/15/2021	1.1	9/15/2026	9/15/2021	102.01488	98.6578057	95.43329912	92.33533365	89.35819821	86.49647534	83.74502416	81.0989643	78.55366106
140219A00005	2/19/2014	3.13	2/20/2029	2/19/2014	108.91034	105.642579	102.5209974	99.5376982	96.6852697	93.95675389	91.34561542	88.84571314	86.45127356
190315A00023	3/15/2019	2.88	3/15/2034	3/15/2019	114.0862	107.975526	102.3268111	97.09934184	92.2563692	87.76469086	83.59428199	79.7179669	76.11112675
200520A00009	5/20/2020	1.63	5/20/2038	5/20/2020	107.54985	96.7499641	87.31772421	79.06385717	71.82672737	65.46813816	59.8697911	54.93029834	50.56265933
210714A00017	7/14/2021	0.73	7/12/2024	7/14/2021	99.574411	98.21582649	96.88382163	95.57767152	94.2966774	93.04016541	91.80748545	90.59801016	89.4111339
200206A00031	2/6/2020	2.15	2/6/2030	2/6/2020	109.39655	103.0818353	97.19908294	91.7160239	86.60297241	81.83260845	77.37977709	73.22130575	69.33583786
170303A00004	3/3/2017	2.8	3/4/2024	3/3/2017	101.88509	100.7373108	99.61567018	98.51928242	97.44729924	96.39891001	95.3733397	94.36984693	93.38772218
200501A00002	5/1/2020	1.3	5/1/2035	5/1/2020	103.38636	97.35235329	91.81392101	86.72377248	82.0395817	77.72342978	73.74131154	70.06270063	66.66016602
210420A00035	4/20/2021	1.92	4/20/2034	4/20/2021	107.66061	100.9261595	94.76883656	89.13203409	83.96518624	79.22308099	74.86525598	70.85546616	67.16121439
180914A00049	9/14/2018	3.37	9/14/2033	9/14/2018	116.45587	110.4807048	104.9394734	99.795362	95.01501643	90.56818724	86.4274173	82.56776303	78.96654526
200814A00003	8/14/2020	0.96	8/14/2035	8/14/2020	102.58378	96.44353793	90.81882873	85.65943467	80.92051746	76.56199886	72.54801776	68.84645282	65.42850251
211208A00013	12/8/2021	1.63	12/8/2026	12/8/2021	104.28702	100.6257257	97.11729774	93.75453018	90.53059088	87.43900445	84.47363171	81.62865043	78.89853725
170406A00027	4/6/2017	2.61	4/8/2024	4/6/2017	101.8333	100.6065183	99.40679696	98.23323835	97.08498315	95.96120969	94.86113191	93.78399742	92.72908572
210809A00014	8/9/2021	1.06	8/7/2026	8/9/2021	101.77244	98.50795791	95.36951842	92.3515263	89.4486706	86.65590615	83.96843857	81.38171026	78.8913872
200429A00030	4/29/2020	1.41	4/29/2030	4/29/2020	104.57541	98.53253744	92.91002466	87.67587767	82.80070625	78.25750309	74.02143869	70.069675	66.38119582
150601A00396	6/1/2015	3.61	1/3/2029	6/1/2015	108.98647	105.912718	102.9711398	100.1548089	97.45721875	94.87225054	92.39414752	90.01749104	87.73717841
150601A00739	6/1/2015	2.35	5/6/2025	6/1/2015	101.59881	100.4325557	99.29108479	98.17366289	97.07958089	96.0081567	94.958734	93.93068101	92.92338937
150601A01051	6/1/2015	4.91	2/7/2025	6/1/2015	108.47049	106.4291015	104.4382299	102.496272	100.6016881	98.75299885	96.94878286	95.18767346	93.46835638
150601A00477	6/1/2015	3.21	6/1/2029	6/1/2015	110.27268	106.5532898	103.0117875	99.63806495	96.42266634	93.35673859	90.43198889	87.64064557	84.97542185
160928A00033	9/28/2016	2.46	9/29/2036	9/28/2016	111.41846	104.203588	97.63843553	91.65460862	86.19164293	81.19601882	76.62030413	72.42240916	68.56493821
150601A00919	6/1/2015	7.41	6/7/2030	6/1/2015	128.72572	124.0173105	119.5577611	115.3314442	111.3238323	107.5214176	103.9116328	100.4827795	97.22396208
220610A00068	6/10/2022	3.09	6/10/2025	6/10/2022	102.96394	101.7119811	100.4876717	99.29017222	98.11867416	96.97240012	95.85060235	94.75256138	93.67758469
150601A00871	6/1/2015	6.74	7/31/2028	6/1/2015	119.08131	115.7927139	112.6392598	109.6142025	106.7111859	103.9242151	101.2476341	98.67610388	96.20458257
200225A00049	2/25/2020	1.79	2/24/2040	2/25/2020	108.42765	100.2153588	92.88300812	86.32128066	80.4357265	75.14460376	70.37705153	66.07153939	62.17454994
150601A00950	6/1/2015	6.76	12/18/2031	6/1/2015	131.02838	125.3409317	120.005624	114.9968014	110.2908888	105.8662115	101.702828	97.7823794	94.0879524
150601A00966	6/1/2015	4.84	2/3/2023	6/1/2015	100.24078	100.1880423	100.1354006	100.0828558	100.0304075	99.97805544	99.92579941	99.87363909	99.82157422
080423A00066	4/23/2008	4.41	4/24/2023	4/23/2008	101.18347	100.863797	100.5461537	100.2305198	99.91687621	99.60520415	99.29548496	98.98770025	98.68183187
150601A00864	6/1/2015	7.37	3/31/2028	6/1/2015	119.79911	116.6685877	113.6611862	110.7709886	107.9924065	105.3201592	102.7492551	100.2749734	97.89284759
970806A00018	8/1/1997	6.7	10/23/2026	8/1/1997	111.66234	109.6470774	107.6916223	105.793703	103.9511483	102.1618856	100.4239354	98.73540681	97.09449231
200401A00011	4/1/2020	0.68	4/3/2023	4/1/2020	99.987902	99.83450273	99.68176335	99.52967934	99.37824618	99.2274594	99.07731456	98.92780729	98.77893324
150601A00953	6/1/2015	6.6	6/10/2032	6/1/2015	132.56846	126.4025896	120.6404785	115.2511973	110.2064477	105.4803188	101.0490688	96.8909279	92.98592006

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150601A00964	6/1/2015	5.25	1/6/2033	6/1/2015	123.67768	118.1457105	112.9784709	108.1474046	103.626452	99.39181421	95.42173993	91.69633344	88.19738208
110414A00007	4/14/2011	3.95	1/21/2025	4/14/2011	103.7288	102.4584152	101.2142612	99.99558644	98.80166831	97.63181052	96.48534188	95.36161519	94.26000623
200210A00007	2/10/2020	1.78	2/10/2025	2/10/2023	102.04555	100.2710166	98.53965872	96.85011155	95.20106538	93.59126201	92.01949229	90.48459382	88.98544865
221206A00040	12/6/2022	5	11/29/2024	12/6/2022	104.14538	103.0966737	102.0681902	101.0593604	100.0696367	99.09849185	98.145418	97.20992559	96.29154267
150601A00906	6/1/2015	6.2	11/1/2029	6/1/2015	121.61259	117.4997298	113.5894855	109.8699281	106.3299259	102.9590831	99.74768557	96.68665216	93.76748863
150601A00261	6/1/2015	3.19	2/11/2033	6/1/2015	119.20198	111.4446501	104.346429	97.84477121	91.88351516	86.41219314	81.38541966	76.76234877	72.5061924
150601A00459	6/1/2015	2.42	5/16/2024	6/1/2015	100.88783	100.2003669	99.52456973	98.86012402	98.20672245	97.56406929	96.93187988	96.30988001	95.69780548
190102A00015	1/2/2019	2.97	1/3/2034	1/2/2019	113.7381	108.0149918	102.7090229	97.784408	93.20876795	88.95278108	84.98987059	81.29592627	77.84905611
160928A00042	9/28/2016	3.05	9/29/2036	9/28/2021	115.5946	108.1726209	101.4154902	95.25344792	89.62480828	84.47495395	79.75546507	75.42336209	71.44044659
150601A00736	6/1/2015	2.87	5/1/2030	6/1/2015	108.20742	104.4955138	100.9733041	97.62915971	94.45225428	91.43250669	88.56052461	85.82755263	83.22542462
200130A00027	1/31/2020	1.79	1/31/2025	1/31/2020	100.81037	99.78202038	98.77409176	97.78600063	96.8171847	95.86710265	94.93523319	94.02107412	93.12414145
150601A01013	6/1/2015	5.21	9/29/2023	6/1/2015	103.08587	102.3445714	101.6141257	100.8942942	100.1848455	99.48555529	98.79620549	98.11658428	97.4464858
150601A00897	6/1/2015	6.15	5/28/2029	6/1/2015	119.81453	116.0493977	112.4581158	109.0310366	105.7591229	102.6339035	99.64743404	96.79226017	94.06138444
150601A01048	6/1/2015	5.27	1/3/2025	6/1/2015	108.72721	106.7713377	104.8624754	102.9991821	101.1800752	99.40382403	97.66914737	95.97481134	94.31962729
160928A00032	9/28/2016	2.52	9/29/2036	9/28/2016	111.84315	104.6072185	98.02254278	92.02059227	86.54077839	81.52946985	76.93913405	72.72759082	68.85736279
170130A00043	1/30/2017	2.64	1/29/2027	1/30/2017	104.10111	102.0086572	99.98470409	98.02642641	96.13114025	94.29629142	92.5194482	90.79829457	89.13062393
190823A00009	8/23/2019	1.8	8/23/2029	8/23/2019	104.82695	101.5005967	98.33200984	95.31217072	92.43265025	89.6855627	87.06352699	84.55963084	82.16739782
191115A00029	11/15/2019	2.07	11/15/2029	11/15/2019	105.14495	101.7148186	98.45174141	95.34593158	92.38825437	89.57017737	86.88372667	84.3214464	81.87636158
050823A00088	8/23/2005	4.78	8/25/2025	8/23/2005	110.42146	107.9247123	105.5009713	103.1476108	100.862115	98.64207626	96.48518997	94.38924907	92.35213927
150601A00270	6/1/2015	3.12	3/21/2031	6/1/2015	117.96834	110.7275436	104.033659	97.84125063	92.10892978	86.79897293	81.87697701	77.31154904	73.07402628
110824A00006	8/24/2011	2.69	8/24/2026	8/24/2011	104.76636	102.5609361	100.4242025	98.35342494	96.34599803	94.39943986	92.51138522	90.67957911	88.90187084
070518A00023	5/18/2007	5.46	5/18/2027	5/18/2007	111.70029	109.1787651	106.7462242	104.3987628	102.1326757	99.9444449	97.83072928	95.78835439	93.81430316
160930A00032	9/30/2016	2.15	9/30/2031	9/30/2016	106.6165	102.2806915	98.20310119	94.36547491	90.75100386	87.34419989	84.13078216	81.0975743	78.232411
150601A01041	6/1/2015	5.99	10/2/2036	6/1/2015	140.76374	131.6307406	123.3227322	115.7535118	108.8467563	102.5348067	96.75761442	91.46182217	86.59996317
190520A00020	5/20/2019	2.39	5/20/2026	5/20/2019	103.10176	101.3956309	99.73645558	98.12256062	96.55234328	95.0242697	93.53687143	92.0887422	90.67853477
130207A00012	2/7/2013	2.9	2/7/2033	2/7/2013	111.29282	106.0024539	101.0822147	96.50162304	92.2329861	88.25112542	84.53312928	81.05813127	77.80711195
050812A00050	8/12/2005	4.97	8/12/2025	8/12/2005	106.83732	105.1557815	103.5154343	101.9149186	100.3529352	98.82823813	97.33963185	95.88596891	94.46614755
120410A00005	4/10/2012	2.35	4/12/2027	4/10/2012	104.5044	102.1456344	99.86961168	97.67272304	95.55154424	93.50282377	91.52347296	89.61055678	87.76128509
150601A00690	6/1/2015	2.34	2/28/2025	6/1/2015	101.41493	100.3460048	99.29868161	98.2723403	97.26637944	96.28022025	95.31330553	94.36509864	93.43508252
170130A00046	1/30/2017	2.52	1/30/2026	1/30/2017	102.71622	101.1334608	99.59297241	98.09327763	96.63296201	95.21067111	93.82510748	92.47502782	91.1592403
150601A00448	6/1/2015	2.61	4/26/2024	6/1/2015	100.98194	100.3175366	99.66442233	99.02227898	98.39080512	97.76971089	97.15871743	96.55755632	95.96596911
160928A00041	9/28/2016	3.26	9/29/2036	9/30/2019	117.08102	109.5853276	102.7598656	96.53439072	90.84678239	85.64203256	80.87136981	76.49149788	72.46393263
150601A00943	6/1/2015	6.44	5/9/2031	6/1/2015	127.78151	122.5198529	117.567003	112.9015966	108.5039251	104.3557914	100.4403837	96.74216035	93.24674466

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
050823A00085	8/23/2005	4.78	8/25/2025	8/23/2005	110.42144	107.9246949	105.5009588	103.1476031	100.8621119	98.64207753	96.48519545	94.38925862	92.35215272
170130A00039	1/30/2017	2.74	1/31/2028	1/30/2017	105.55101	102.9418017	100.4338415	98.02229422	95.70259338	93.4704232	91.32170295	89.25257255	87.25937911
200310A00067	3/10/2020	0.94	3/10/2025	3/10/2020	99.946463	98.84617933	97.76866364	96.71324738	95.67928793	94.66616711	93.67328999	92.70008383	91.74599702
150601A00905	6/1/2015	6.14	10/29/2029	6/1/2015	121.14238	117.0883748	113.232193	109.5622901	106.0678861	102.7389077	99.56593728	96.54016577	93.65334909
150601A00993	6/1/2015	5.37	6/9/2034	6/1/2015	130.38828	123.208462	116.5825703	110.4609086	104.7986987	99.55555432	94.69501763	90.18414655	85.99314897
150601A00473	6/1/2015	2.22	5/31/2024	6/1/2015	100.9184	100.2060909	99.50599169	98.81777017	98.1411052	97.4756877	96.82122005	96.17741555	95.5439979
150601A00527	6/1/2015	2.5	7/26/2024	6/1/2015	101.09027	100.3048229	99.53319461	98.77500488	98.02989071	97.29750254	96.57750364	95.86956949	95.17338723
150601A00893	6/1/2015	6.49	4/6/2029	6/1/2015	120.86927	117.102867	113.5086762	110.0772345	106.7996693	103.6676588	100.6733939	97.80954342	95.06922134
190327A00030	3/27/2019	2.9	3/27/2036	3/27/2019	113.71158	107.0354383	100.9241384	95.32168793	90.17822408	85.44929194	81.09521298	77.08053179	73.37353077
200317A00024	3/17/2020	1.09	3/17/2025	3/17/2020	100.11674	99.01443488	97.93495132	96.87762019	95.84179677	94.82686088	93.83221572	92.85728675	91.90152067
150601A00030	6/1/2015	5.28	11/26/2027	6/1/2015	121.77747	117.0766798	112.6035931	108.3457446	104.2914238	100.4296221	96.74998749	93.24278152	89.89883978
140911A00033	9/11/2014	3.02	9/13/2027	9/11/2014	108.22419	104.8364357	101.5920908	98.48390902	95.50506331	92.64911712	89.90999941	87.28198144	84.75965511
150601A01040	6/1/2015	5.4	10/2/2026	6/1/2015	117.0894	113.4908323	110.0321149	106.706915	103.5092266	100.4333528	97.47388824	94.62570207	91.88392193
150601A00928	6/1/2015	5.94	8/21/2030	6/1/2015	120.9868	116.7814199	112.7958404	109.0162321	105.4297543	102.0244734	98.78929221	95.71388544	92.7886403
130624A00019	6/24/2013	3.4	6/26/2023	6/24/2013	101.18221	100.6788434	100.1803759	99.68673679	99.19785637	98.71366611	98.23409883	97.75908863	97.28857087
150601A00931	6/1/2015	7.13	9/20/2030	6/1/2015	128.45076	123.5991865	119.0116034	114.6709769	110.561506	106.6685262	102.9784204	99.47853668	96.15711289
130206A00004	2/6/2013	2.14	2/7/2028	2/6/2013	104.72847	102.047116	99.47132448	96.99597811	94.61625117	92.32758679	90.12568009	88.00646239	85.96608661
170130A00036	1/30/2017	3.11	1/31/2033	1/30/2017	112.26811	107.0523576	102.1916396	97.65740498	93.42365837	89.46671357	85.76497072	82.29871667	79.04994571
150601A00946	6/1/2015	6.28	8/22/2031	6/1/2015	127.9177	122.4814377	117.373152	112.5695725	108.0492721	103.7925064	99.78106952	95.99816349	92.42827938
160928A00044	9/28/2016	2.89	9/29/2036	9/28/2023	114.46209	107.096273	100.3912042	94.2774915	88.69378039	83.5857512	78.90525193	74.60954435	70.66064771
210514A00010	5/14/2021	1.34	5/14/2031	5/14/2021	103.94027	99.80220082	95.90449284	92.23058332	88.76518817	85.49419467	82.40456331	79.48423854	76.72206753
150601A00875	6/1/2015	7.14	9/29/2028	6/1/2015	120.86442	117.448828	114.1767909	111.0409929	108.0345464	105.150963	102.3841282	99.72827686	97.17797115
150601A00900	6/1/2015	6.06	6/28/2024	6/1/2015	103.74411	102.9981528	102.2650585	101.5444708	100.8360507	100.139472	99.45442089	98.7805947	98.11770193
181211A00042	12/11/2018	3.7	12/11/2028	12/11/2023	114.87044	109.8859989	105.1819619	100.740632	96.54552857	92.58130019	88.83364085	85.28921338	81.93557864
970806A00059	8/1/1997	8.25	9/22/2025	8/1/1997	110.13985	108.6807017	107.2553551	105.8627513	104.5018707	103.171734	101.8713998	100.5999633	99.35655418
150601A00883	6/1/2015	6.21	11/30/2028	6/1/2015	118.342	114.9142122	111.6338885	108.4933551	105.4853923	102.6032075	99.84040681	97.19096888	94.64922083
150601A00899	6/1/2015	7.07	6/14/2029	6/1/2015	120.66011	117.1149338	113.7294742	110.4949689	107.4032038	104.4464763	101.6175601	98.90967258	96.31644407
150601A00976	6/1/2015	6.8	9/22/2033	6/1/2015	136.89937	129.9400852	123.4830719	117.4859077	111.910139	106.7208797	101.886453	97.37807213	93.16955435
200331A00056	3/31/2020	0.96	3/29/2030	3/31/2020	102.1355	98.59291354	95.23161812	92.04052118	89.00929331	86.12831415	83.38861871	80.78184823	78.30020492
150601A00939	6/1/2015	5.79	1/17/2031	6/1/2015	123.22924	118.4146536	113.8711428	109.5806297	105.5263908	101.6929435	98.06594522	94.63210146	91.37908207
171206A00020	12/6/2017	2.62	12/6/2027	12/6/2017	105.04762	102.5463782	100.1377432	97.81747488	95.58156221	93.42620598	91.34780609	89.34294975	87.40840047
150601A00929	6/1/2015	5.91	8/30/2030	6/1/2015	123.05626	118.3947429	113.9872188	109.8172899	105.8697439	102.1304637	98.58634024	95.22519403	92.03570261
210409A00010	4/9/2021	1.05	4/9/2031	4/9/2021	102.69941	98.6347431	94.80454714	91.1927771	87.78461973	84.56638945	81.52543445	78.65005124	75.92940684

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150601A00678	6/1/2015	2.12	1/30/2025	6/1/2015	101.138	100.0978874	99.078508	98.07926343	97.09958188	96.13891297	95.19672666	94.27251232	93.36577789
181029A00097	10/29/2018	3.53	10/27/2028	10/29/2018	114.23456	109.3371015	104.7089237	100.3333503	96.19483656	92.2788837	88.57196272	85.0614445	81.73553524
190102A00020	1/2/2019	2.97	1/3/2034	1/2/2019	113.738	108.0149437	102.7090188	97.78444197	93.20883476	88.95287612	84.98998983	81.29606617	77.84921358
200428A00018	4/28/2020	1.33	4/27/2035	4/28/2020	103.50983	97.65892366	92.27991162	87.32833864	82.7643747	78.55229428	74.66002069	71.05872423	67.7224673
120827A00052	8/27/2012	2.01	8/27/2027	8/27/2012	104.35148	101.6857419	99.12003091	96.64969046	94.27031357	91.97773104	89.76799687	87.63737462	85.58232486
970806A00017	8/1/1997	7.02	7/23/2026	8/1/1997	111.38579	109.5064765	107.6800728	105.9046556	104.1783822	102.4994907	100.8662954	99.27718338	97.7306105
150601A00038	6/1/2015	5.77	6/2/2023	6/1/2015	102.09113	101.6661151	101.2446711	100.8267548	100.412322	100.0013292	99.59373338	99.18949252	98.78856516
191114A00014	11/14/2019	1.9	11/14/2023	11/14/2019	100.38511	99.9302249	99.48099042	99.03729357	98.59902082	98.16606188	97.73830961	97.31565992	96.89801162
150601A00018	6/1/2015	4.91	9/5/2025	6/1/2015	111.00746	108.4102003	105.8904536	103.4453931	101.0723137	98.76862793	96.53186027	94.35964132	92.24970239
200402A00050	4/6/2020	0.73	4/5/2024	4/6/2020	99.743908	99.08877261	98.44512059	97.81261891	97.19094825	96.57980207	95.97888595	95.38791695	94.80662309
150601A01016	6/1/2015	5.73	10/28/2025	6/1/2015	113.55796	110.8361177	108.1984649	105.6419132	103.1635019	100.7603956	98.42987806	96.16934647	93.97630619
150601A00971	6/1/2015	6.42	6/20/2033	6/1/2015	133.31712	126.5358472	120.2388506	114.3858114	108.9401236	103.8685239	99.14076178	94.72930454	90.60907279
150601A00888	6/1/2015	5.92	3/1/2029	6/1/2015	118.38928	114.7775813	111.3285593	108.0333829	104.8837703	101.8719479	98.990616	96.23291663	93.5924036
121120A00010	11/20/2012	1.93	11/22/2027	11/20/2012	104.54918	101.6139557	98.79463022	96.08566268	93.48181891	90.9781498	88.56997392	86.25286136	84.02261859
150601A00023	6/1/2015	5.46	10/30/2037	6/1/2015	139.25927	129.4844763	120.65766	112.6729197	105.4372816	98.86901692	92.89618906	87.45539727	82.49069128
120217A00007	2/17/2012	2.25	2/20/2024	2/17/2012	101.20884	100.2563369	99.324478	98.41257823	97.5199845	96.64607208	95.79024306	94.95192487	94.13056899
130925A00035	9/25/2013	1.53	6/25/2025	9/25/2013	101.30643	99.8172152	98.36328416	96.94352555	95.55686961	94.20228803	92.87879207	91.58543072	90.321289
180529A00057	5/29/2018	3.09	5/30/2028	5/29/2018	109.51131	106.0097801	102.6700914	99.48339567	96.441385	93.53625922	90.76069186	88.10779843	85.57110707
210514A00007	5/14/2021	0.95	5/15/2028	5/14/2021	101.58045	98.92286407	96.37138728	93.92083695	91.56632321	89.30322961	87.12719592	85.03410216	83.02005376
150601A01005	6/1/2015	5.82	3/10/2025	6/1/2015	110.57795	108.4607393	106.3971554	104.3854437	102.4239207	100.5109717	98.64504744	96.82466087	95.04838404
150601A00948	6/1/2015	6.04	10/22/2031	6/1/2015	123.34622	118.4971683	113.9326039	109.6325664	105.5786664	101.7539538	98.14279482	94.73075984	91.50452179
150601A00395	6/1/2015	2.86	1/3/2024	6/1/2015	100.8932	100.3853458	99.88449463	99.3904871	98.90316697	98.42238307	97.94798901	97.47984304	97.01780781
150601A00001	6/1/2015	5.43	6/15/2037	6/1/2015	138.13928	128.668203	120.0951962	112.3220942	105.2624648	98.84011377	92.98778784	87.64605085	82.7623094
150601A00425	6/1/2015	2.64	2/21/2024	6/1/2015	100.87284	100.2977592	99.73161192	99.17416698	98.62520126	98.08449969	97.55185485	97.02706663	96.50994193
150601A00426	6/1/2015	3.37	2/21/2029	6/1/2015	108.46463	105.3333735	102.3394568	99.47555765	96.73480087	94.11072758	91.59726726	89.18871168	86.87969081
121120A00011	11/20/2012	2.22	11/22/2027	11/20/2012	107.67947	103.7001893	99.90720851	96.2905457	92.84081172	89.54917218	86.40731155	83.40739991	80.54206191
120621A00009	6/21/2012	3.18	6/21/2032	6/21/2012	115.7833	109.1389118	103.0112021	97.35453491	92.12764396	87.29318852	82.81735585	78.669506	74.82185434
180126A00018	1/26/2018	2.34	1/26/2023	1/26/2018	100.08507	100.0461627	100.0073159	99.96853021	99.92980545	99.8911415	99.85253819	99.8139954	99.77551298
150601A00927	6/1/2015	6.08	8/7/2030	6/1/2015	121.41543	117.2191388	113.2411345	109.4677408	105.8862561	102.4848723	99.25260576	96.17923376	93.25523645
200316A00008	3/16/2020	1.31	3/15/2030	3/16/2020	102.6067	99.07873734	95.73032239	92.55051748	89.52913508	86.65668411	83.92431749	81.32378398	78.84738393
150601A00872	6/1/2015	7.42	7/31/2028	6/1/2015	120.931	117.6318441	114.4675408	111.431379	108.5170349	105.7185436	103.0302765	100.4469199	97.96345533
150601A00558	6/1/2015	2.51	8/30/2024	6/1/2015	101.17565	100.3423125	99.52392313	98.72007288	97.93036523	97.15441845	96.39186487	95.64235028	94.90553323
120119A00015	1/19/2012	2.27	1/19/2024	1/19/2012	101.11044	100.2434516	99.39408093	98.56178764	97.74605191	96.94637481	96.1622773	95.39329928	94.63899858

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
160928A00029	9/28/2016	2.52	9/29/2036	9/28/2016	111.84315	104.6072185	98.02254278	92.02059227	86.54077839	81.52946985	76.93913405	72.72759082	68.85736279
140414A00009	4/14/2014	2.32	4/30/2024	4/14/2014	101.20782	100.3684886	99.54203024	98.7281483	97.92655829	97.13698436	96.35915897	95.59282255	94.83772324
030605A00010	6/5/2003	3.97	6/5/2023	6/5/2003	101.40112	100.9654569	100.5335422	100.105331	99.68077554	99.25982911	98.8424457	98.42858007	98.01818777
150601A00952	6/1/2015	6.34	2/13/2032	6/1/2015	129.96229	124.1215064	118.6513215	113.5241773	108.7147948	104.1999689	99.95838367	95.97044541	92.21813091
190102A00022	1/2/2019	2.97	1/3/2034	1/2/2019	113.73791	108.0148983	102.709015	97.78447399	93.20889771	88.95296567	84.99010218	81.29619798	77.84936193
150601A00865	6/1/2015	6	4/3/2028	6/1/2015	114.64542	111.8294893	109.121502	106.5163474	104.0091942	101.5954749	99.2708692	97.03128928	94.87286544
160928A00030	9/28/2016	2.52	9/29/2036	9/28/2016	111.84315	104.6072185	98.02254278	92.02059227	86.54077839	81.52946985	76.93913405	72.72759082	68.85736279
150601A00035	6/1/2015	5.73	4/1/2038	6/1/2015	137.37271	128.5584647	120.5690867	113.3137426	106.7126545	100.6956514	95.20092435	90.17395279	85.56657683
120827A00048	8/27/2012	2.01	8/27/2027	8/27/2012	104.35148	101.6857405	99.12003076	96.64969139	94.27031551	91.97773393	89.76800063	87.63737921	85.58233022
121217A00009	12/17/2012	2.02	12/17/2027	12/17/2012	104.13629	101.6156543	99.1962933	96.87329129	94.64200726	92.49805686	90.43729652	88.45580863	86.54988779
150601A00033	6/1/2015	5.96	12/24/2025	6/1/2015	115.21345	112.2836109	109.44911	106.7062736	104.0515949	101.4817225	98.99345219	96.58371998	94.24959477
200311A00028	3/11/2020	1.04	3/12/2024	3/11/2020	99.942447	99.3313987	98.73106674	98.14114175	97.56132715	96.99133813	96.4309011	95.87975309	95.33764123
200326A00037	3/26/2020	1.78	3/26/2035	3/26/2020	106.22938	100.3076346	94.85881865	89.83874423	85.20778264	80.93036005	76.97451025	73.31147985	69.9153794
150601A00509	6/1/2015	2.52	7/8/2024	6/1/2015	101.06422	100.3050366	99.55906736	98.82595638	98.10535728	97.39693648	96.70037266	96.01535615	95.34158841
150601A00832	6/1/2015	7.17	8/28/2025	6/1/2015	108.24347	106.8651836	105.518403	104.2021441	102.9154627	101.6574516	100.4272389	99.22398613	98.04688692
150601A00475	6/1/2015	3.04	6/1/2029	6/1/2015	107.79156	104.5386355	101.4339573	98.46934359	95.63712838	92.93012473	90.34159146	87.86520239	85.495018
150601A01012	6/1/2015	5.43	9/15/2023	6/1/2015	103.09668	102.3918765	101.6968896	101.0115158	100.3355553	99.6688141	99.01110343	98.36223962	97.722044
170929A00046	9/29/2017	2.49	9/30/2027	9/29/2017	104.4375	102.0675413	99.78182043	97.57661801	95.44840535	93.39383463	91.4097284	89.49306971	87.6409929
150601A00955	6/1/2015	5.84	7/15/2032	6/1/2015	125.41557	120.0783508	115.0777125	110.3883729	105.987176	101.8528984	97.96607315	94.30883123	90.86475818
160930A00033	9/30/2016	1.8	9/30/2026	9/30/2016	101.98636	100.1382463	98.34468806	96.60362214	94.91308244	93.27119129	91.67615486	90.1262588	88.6198641
150601A00851	6/1/2015	7.12	4/30/2027	6/1/2015	115.29473	112.8095692	110.4076815	108.0855835	105.8399638	103.6676727	101.5657132	99.5312323	97.56151334
150601A01047	6/1/2015	5.35	12/30/2024	6/1/2015	108.8277	106.8805526	104.9800571	103.1247911	101.3133879	99.54453203	97.8169566	96.12944133	94.48081041
220629A00034	6/29/2022	3.51	6/29/2027	6/29/2022	106.44775	104.169658	101.9688482	99.84204371	97.78612795	95.79813851	93.87525861	92.0148089	90.21423977
150601A00868	6/1/2015	7.08	6/5/2028	6/1/2015	119.65812	116.4254799	113.3235266	110.3458294	107.4863206	104.7392737	102.0992818	99.56123756	97.12031472
111007A00007	10/7/2011	3.92	10/7/2031	10/7/2011	121.80155	114.4186143	107.6003737	101.2985817	95.46943469	90.07313664	85.07350998	80.43764548	76.13558815
150601A00005	6/1/2015	4.84	6/9/2025	6/1/2015	109.7912	107.4272424	105.1291291	102.8946321	100.7216154	98.60802811	96.55190025	94.55133932	92.60452664
130624A00017	6/24/2013	3.4	6/26/2023	6/24/2013	101.18221	100.6788434	100.1803759	99.68673679	99.19785637	98.71366611	98.23409883	97.75908863	97.28857087
150601A00410	6/1/2015	2.68	1/24/2024	6/1/2015	100.84016	100.3050293	99.7776575	99.25785927	98.74545308	98.24026347	97.74212088	97.25086133	96.76632621
150601A00988	6/1/2015	4.57	3/22/2024	6/1/2015	102.11416	101.4929396	100.8819977	100.2810504	99.68982505	99.10805928	98.53550078	97.97190667	97.41704305
170313A00041	3/13/2017	3.21	3/15/2032	3/13/2017	111.80285	107.0761799	102.6428585	98.4812791	94.57161419	90.89565696	87.43667697	84.1792895	81.10933738
150601A00889	6/1/2015	6.55	3/2/2029	6/1/2015	120.97104	117.2233709	113.6456477	110.2286063	106.9635613	103.842362	100.8573556	98.00135398	95.26760167
200203A00046	2/3/2020	1.98	2/3/2040	2/3/2020	110.02651	101.7278362	94.31633583	87.68196084	81.72960833	76.37695748	71.5526333	67.19464832	63.24907817
150601A01015	6/1/2015	5.61	10/28/2025	6/1/2015	113.24855	110.5310002	107.8975449	105.3450914	102.8706823	100.471485	98.14478635	95.88798628	93.69859286

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
150601A00935	6/1/2015	6.46	11/21/2030	6/1/2015	126.01528	121.1516644	116.557855	112.2161308	108.1100745	104.2244697	100.5452042	97.0591825	93.75424563
150601A00022	6/1/2015	5.43	10/26/2037	6/1/2015	134.36246	125.9150513	118.2412685	111.2577755	104.8911573	99.0766503	93.75704486	88.88173593	84.40589974
150601A00918	6/1/2015	5.62	4/28/2025	6/1/2015	105.61429	104.4200973	103.2509152	102.106002	100.9846465	99.88616438	98.80989746	97.75521214	96.72149839
150601A00496	6/1/2015	2.27	6/27/2024	6/1/2015	101.00458	100.2579628	99.52430244	98.8032486	98.09446106	97.39761224	96.71238665	96.03848028	95.37560009
200521A00005	5/21/2020	0.75	5/21/2030	5/21/2020	101.38486	97.78251095	94.36835129	91.13064947	88.05849587	85.14174237	82.37094388	79.7373048	77.23262981
140311A00039	3/11/2014	3.06	3/11/2024	3/11/2014	102.00295	100.9300162	99.88141795	98.85631318	97.85390099	96.87341666	95.91412968	94.97534182	94.05638536
190628A00007	6/28/2019	2.28	6/28/2034	6/28/2019	110.19167	104.399906	99.04624119	94.0917926	89.50150032	85.24372115	81.28986887	77.61409485	74.19300417
130913A00018	9/13/2013	3.72	9/13/2028	9/13/2013	110.18928	106.8048765	103.5684128	100.4719777	97.50814965	94.66995998	91.95086173	89.34470123	86.84569162
150601A00912	6/1/2015	5.96	11/30/2029	6/1/2015	120.74758	116.6507578	112.7561613	109.0518658	105.5267456	102.1704114	98.97315605	95.92590553	93.02017308
150601A00411	6/1/2015	3.38	1/24/2029	6/1/2015	108.38285	105.2933663	102.3378888	99.50934217	96.8010822	94.20686329	91.7208119	89.33740178	87.05143108
190102A00024	1/2/2019	2.97	1/3/2034	1/2/2019	113.73795	108.0149189	102.7090167	97.78445948	93.20886919	88.95292509	84.99005126	81.29613824	77.84929469
150601A00960	6/1/2015	6.49	12/16/2032	6/1/2015	129.64693	123.9499245	118.6241788	113.6408803	108.9737214	104.5986601	100.4937071	96.63873507	93.01530632
150601A00978	6/1/2015	6.32	11/24/2033	6/1/2015	131.3049	125.0441351	119.2239846	113.8076432	108.7617351	104.0559671	99.66281947	95.55727002	91.71654733
160210A00041	2/10/2016	1.97	2/10/2023	2/10/2016	100.17723	100.0608074	99.94466607	99.82880692	99.71322888	99.59793088	99.48291188	99.36817083	99.25370671
160520A00017	9/20/2017	2.34	9/20/2024	9/20/2017	102.415	100.7142412	99.04968203	97.4202284	95.82483301	94.26249052	92.73223542	91.23313998	89.76431242
180518A00046	5/25/2018	3.62	5/18/2027	5/25/2018	114.04599	109.5379451	105.2371322	101.1329418	97.21535908	93.47493015	89.90272771	86.4903191	83.22973642
191002A00038	1/13/2020	1.76	1/13/2023	1/13/2020	100.05951	100.0206528	99.98184488	99.94308475	99.90437227	99.86570735	99.8270899	99.78851982	99.74999702
191002A00044	2/3/2020	1.75	2/3/2023	2/3/2020	100.13861	100.0415514	99.94468207	99.84800619	99.75152314	99.65523231	99.55913314	99.46322502	99.36750739
190329A00012	3/29/2019	2.61	3/29/2024	3/29/2019	101.81828	100.5836266	99.37885002	98.20287325	97.05467289	95.93327353	94.83774491	93.76719943	92.72078964
130211A00016	2/11/2013	2.27	2/15/2023	2/11/2013	100.22814	100.0978693	99.96794954	99.83837982	99.70915869	99.5802847	99.45175644	99.32357249	99.19573144
190829A00080	8/29/2019	1.8	12/29/2023	8/29/2019	100.61803	99.63089746	98.66304955	97.71392293	96.78297877	95.86969871	94.97358394	94.09415427	93.23094723
141215A00062	12/15/2014	2.65	12/16/2024	12/15/2014	103.92301	101.9684897	100.0606567	98.19811097	96.37950292	94.60353246	92.8689467	91.17453793	89.51914167
160212A00037	2/12/2016	3.03	2/12/2031	2/12/2016	118.50422	110.2208207	102.5915529	95.56103539	89.07885934	83.09911422	77.5799644	72.48326782	67.77423203
160712A00019	7/12/2017	2.32	7/12/2027	7/12/2017	108.67751	104.1400083	99.8191307	95.70340029	91.78200574	88.04476217	84.48207159	81.08488584	77.84467226
180618A00036	6/18/2018	3.89	6/18/2048	6/18/2018	150.12719	125.6542545	106.102052	90.40785997	77.74743846	67.48008916	59.10663677	52.23723911	46.56668442
180621A00068	6/21/2018	3.32	6/23/2025	6/21/2018	106.45592	103.9700681	101.5555831	99.21001004	96.93098992	94.71625917	92.56364507	90.47106149	88.4365049
170412A00019	4/12/2017	2.56	4/12/2024	4/12/2017	101.84538	100.5746262	99.33097348	98.11355213	96.92153316	95.75412264	94.61055982	93.49011542	92.39209
180726A00046	7/26/2018	3.2	12/26/2023	7/26/2018	102.00883	101.0222007	100.0546471	99.1056233	98.17460038	97.26106953	96.36454094	95.48454294	94.62062117
190829A00078	8/29/2019	1.8	12/15/2023	8/29/2019	100.59506	99.64509347	98.71300145	97.79828469	96.90046078	96.01906498	95.1536495	94.30378269	93.46904832
190515A00032	5/15/2019	2.49	5/15/2024	5/15/2019	101.93797	100.5802178	99.24695905	97.93758624	96.6515131	95.38817208	94.14701362	92.92750546	91.72913192
190501A00014	5/1/2019	2.62	5/1/2024	5/1/2019	102.05	100.7290954	99.43142767	98.1564335	96.90356984	95.67231053	94.46214568	93.27258102	92.10313731
190621A00035	6/21/2019	2.19	12/15/2023	6/21/2019	100.9721	100.0201672	99.086139	98.16951132	97.26980119	96.38654336	95.51928953	94.66760752	93.83108063
160210A00053	2/10/2016	1.99	2/10/2023	2/10/2016	100.17956	100.0631371	99.94699331	99.83113165	99.71555109	99.60025059	99.48522909	99.37048555	99.25601894

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180911A00007	9/11/2018	3.12	9/8/2023	9/11/2018	101.3915	100.699318	100.0165891	99.3431171	98.67871442	98.02319858	97.37639197	96.73812169	96.1082194
081219A00006	12/19/2008	3.88	12/22/2023	12/19/2008	102.8431	101.8600678	100.8958577	99.94993587	99.02178494	98.11090697	97.21682247	96.33906954	95.47720313
160830A00068	11/30/2016	1.95	11/30/2023	11/30/2016	100.70026	99.78963974	98.89542305	98.01716934	97.15445437	96.3068688	95.47401754	94.65551914	93.85100524
171110A00019	5/4/2018	2.46	5/4/2023	5/4/2018	100.54018	100.1950867	99.85236181	99.5119796	99.17391608	98.83814761	98.50465087	98.17340287	97.84438091
200131A00031	1/31/2020	1.74	1/31/2024	1/31/2020	100.61186	99.53767584	98.48631344	97.45705405	96.44920672	95.46210902	94.4951256	93.5476468	92.61908735
170822A00023	8/23/2017	3.95	8/23/2028	8/23/2017	119.54664	113.6334386	108.0576007	102.7979928	97.83491568	93.15000255	88.72612148	84.54728598	80.59857225
160819A00015	10/12/2016	2.3	10/13/2026	10/12/2016	106.87466	103.1031106	99.48543838	96.01452935	92.68363923	89.4863723	86.41666131	83.4687486	80.6371684
170614A00019	6/14/2017	2.48	6/13/2025	6/14/2017	104.3071	101.8743454	99.51089463	97.21438245	94.98253913	92.81318563	90.70422945	88.65366062	86.65954792
160225A00024	2/25/2016	2.22	2/26/2024	2/25/2016	101.2076	100.0614817	98.94123231	97.84598451	96.77490859	95.72721116	94.70213321	93.69894825	92.71696064
180925A00033	9/25/2018	3.26	9/25/2023	9/25/2018	101.5711	100.8325511	100.104739	99.38743072	98.68040001	97.98342701	97.29629811	96.6188057	95.950748
180821A00029	8/21/2018	3.01	8/21/2023	8/21/2018	101.24237	100.5991703	99.96414372	99.33713269	98.71798605	98.10655637	97.50269989	96.90627642	96.31714918
190829A00075	8/29/2019	1.8	6/15/2023	8/29/2019	100.39165	99.93235992	99.47727594	99.02633709	98.57948679	98.13666953	97.69783077	97.26291698	96.83187556
180328A00042	3/28/2018	2.95	3/28/2023	3/28/2018	100.51408	100.2705671	100.0282317	99.78706545	99.54706003	99.3082071	99.07049838	98.83392572	98.59848101
160223A00012	2/23/2016	1.89	2/23/2023	2/23/2016	100.22206	100.0694718	99.91735946	99.76571703	99.61454233	99.46383317	99.31358738	99.16380281	99.01447732
181206A00018	12/6/2018	3.13	12/6/2023	12/6/2018	101.82397	100.8917248	99.97654717	99.07796703	98.19553566	97.32882035	96.47740375	95.64088314	94.81886986
190830A00020	8/31/2020	1.67	8/31/2023	8/31/2020	100.37683	99.70998499	99.05196963	98.4026049	97.76172121	97.12915337	96.50474047	95.88832572	95.27975631
150731A00016	7/31/2015	3.04	7/31/2025	7/31/2015	106.06505	103.4808767	100.9732105	98.53932445	96.176605	93.88254866	91.65475665	89.49092973	87.38886339
171228A00023	12/28/2017	2.69	3/29/2024	12/28/2017	101.91864	100.6833234	99.47789559	98.30127842	97.15244821	96.03042923	94.93429097	93.86314554	92.81614525
161125A00002	11/25/2016	2.62	11/27/2023	11/25/2016	101.30931	100.4036324	99.51411516	98.64032951	97.78186091	96.93830923	96.10928814	95.2944246	94.49335821
191002A00046	2/14/2020	1.75	2/14/2023	2/14/2020	100.15935	100.0319044	99.90479848	99.77802864	99.65159354	99.52549183	99.39972217	99.27428321	99.14917362
160520A00018	9/20/2017	2.34	9/20/2024	9/20/2017	102.415	100.7142412	99.04968203	97.4202284	95.82483301	94.26249052	92.73223542	91.23313998	89.76431242
181220A00041	12/20/2018	3.36	12/18/2026	12/20/2018	111.5056	107.466998	103.5993837	99.89460433	96.34494331	92.94309044	89.68211855	86.55546132	83.55689254
190815A00040	8/15/2019	1.86	8/15/2023	8/15/2019	100.493	99.86863645	99.25201492	98.64299516	98.04143712	97.44720415	96.86016295	96.28018344	95.70713865
190829A00076	8/29/2019	1.81	6/30/2023	8/29/2019	100.4172	99.9171643	99.42208947	98.93190106	98.44652712	97.96589711	97.48994186	97.01859353	96.5517856
160210A00042	2/10/2016	2.57	2/10/2026	2/10/2016	106.13708	103.0337103	100.0376431	97.1445524	94.35031126	91.65098395	89.04281589	86.52222406	84.08578801
180615A00039	6/15/2018	3.49	6/15/2028	6/15/2018	116.53848	110.8956829	105.5668385	100.5327855	95.77563338	91.2786682	87.02626884	83.00383041	79.19769298
191002A00043	2/3/2020	1.75	2/3/2023	2/3/2020	100.13861	100.0415514	99.94468207	99.84800619	99.75152314	99.65523231	99.55913314	99.46322502	99.36750739
150601A00356	6/1/2015	3.66	9/22/2023	6/1/2015	101.81409	101.0826007	100.3616311	99.65095382	98.95034931	98.25960434	97.57851161	96.90686962	96.24448244
160210A00036	2/10/2016	1.77	2/10/2023	2/10/2016	100.16883	100.0522591	99.93597762	99.81998032	99.7042661	99.58883389	99.47368259	99.35881115	99.2442185
180709A00081	7/9/2018	3.05	7/7/2023	7/9/2018	101.07314	100.5521871	100.0366064	99.5263118	99.0212221	98.52125792	98.02634145	97.53639645	97.05134822
160222A00018	2/22/2016	2.59	2/23/2026	2/22/2016	106.29658	103.1541458	100.1213567	97.19374277	94.3670482	91.63721676	89.00038099	86.45285213	83.99111062
160222A00019	2/22/2016	3.09	2/21/2031	2/22/2016	119.03985	110.7108289	103.0408762	95.97406727	89.45950919	83.45086146	77.90590645	72.78616255	68.05653545
190829A00073	8/29/2019	1.81	3/15/2023	8/29/2019	100.21477	100.0074587	99.80101495	99.59543455	99.39071204	99.18684201	98.9838191	98.78163799	98.5802934

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180131A00022	1/31/2018	2.96	1/30/2025	1/31/2018	104.45684	102.3847271	100.3641545	98.39349836	96.47119619	94.5957461	92.76570408	90.97968128	89.23634147
171222A00037	12/22/2017	2.71	12/29/2023	12/22/2017	101.53274	100.5406895	99.56798428	98.61406608	97.67839455	96.7604499	95.85973194	94.97575911	94.10806767
160210A00021	2/10/2016	1.97	2/10/2023	2/10/2016	100.17723	100.0608074	99.94466607	99.82880692	99.71322888	99.59793088	99.48291188	99.36817083	99.25370671
160209A00049	2/9/2016	1.92	2/9/2023	2/9/2016	100.16979	100.0561261	99.94273204	99.82960712	99.71675034	99.60416071	99.49183725	99.37977899	99.26798496
180912A00017	9/12/2018	3.13	9/12/2023	9/12/2018	101.41632	100.7132979	100.020022	99.33629223	98.66191229	97.99669108	97.34044271	96.69298631	96.05414585
181203A00039	12/3/2018	3.27	12/1/2023	12/3/2018	101.92762	101.0082021	100.1053613	99.21865317	98.34764809	97.49193155	96.6511035	95.82477774	95.01258135
160714A00024	9/20/2016	2.5	9/20/2028	9/20/2016	111.45642	105.6952398	100.2701439	95.15972157	90.34403677	85.80452275	81.52388032	77.48598451	73.67579846
180518A00042	5/25/2018	3.42	5/19/2025	5/25/2018	106.3992	104.007328	101.6816753	99.42003971	97.22030916	95.08045345	92.99852081	90.9726343	89.00098854
190815A00041	8/15/2019	1.86	8/15/2024	8/15/2019	101.43098	99.83286136	98.26744833	96.73379784	95.23100679	93.7582062	92.31455955	90.89926128	89.51153534
181001A00031	10/1/2018	3.23	9/29/2023	10/1/2018	101.56774	100.8184772	100.0802577	99.35283908	98.63598547	97.92946798	97.23306426	96.54655827	95.86974012
190327A00027	3/27/2019	2.66	1/15/2025	3/27/2019	103.72922	101.7043879	99.72934912	97.8025537	95.9225147	94.08780189	92.29703902	90.54890142	88.84211365
161118A00026	12/20/2016	3.03	12/21/2026	12/20/2016	110.22216	106.2007159	102.350156	98.66231536	95.12946075	91.7442675	88.49979562	85.38946761	82.40704748
180518A00048	5/25/2018	3.65	5/18/2028	5/25/2018	117.22425	111.6388808	106.359924	101.3689358	96.64867485	92.18301801	87.95688242	83.95615329	80.16761701
170327A00080	3/27/2019	3.43	3/27/2029	3/27/2019	117.74986	111.3006952	105.254498	99.58383451	94.26328437	89.26928348	84.5799786	80.17509391	76.03580875
171228A00024	12/28/2017	2.71	6/28/2024	12/28/2017	102.50411	101.0259331	99.57653904	98.15516342	96.76106601	95.39353216	94.05187164	92.73541767	91.44352586
160211A00036	2/11/2016	2.41	2/11/2026	2/11/2016	105.64509	102.5466077	99.55541044	96.66716116	93.8777297	91.1831775	88.57974743	86.06385426	83.63207556
181029A00051	2/5/2019	3.69	2/5/2029	2/5/2019	119.06591	112.7156668	106.7537861	101.1543544	95.89332488	90.94837102	86.29875479	81.92520531	77.80980765
190726A00014	7/26/2019	2.23	7/24/2024	7/26/2019	101.92059	100.3765449	98.86337918	97.38023346	95.92628099	94.50072505	93.10279758	91.73175786	90.38689129
161017A00007	10/17/2016	1.99	10/18/2023	10/17/2016	100.66399	99.86777686	99.084127	98.31274444	97.55334272	96.80564424	96.06937995	95.34428896	94.63011828
190621A00039	6/21/2019	2.21	6/17/2024	6/21/2019	101.70249	100.2591533	98.84341454	97.45454965	96.09186126	94.75467558	93.44234148	92.1542295	90.889731
190422A00030	4/22/2019	2.93	12/22/2025	4/22/2019	106.868	103.888073	101.0075688	98.22262547	95.52955348	92.92482697	90.4050755	87.96707622	85.60774656
170327A00079	3/27/2019	3.19	3/29/2027	3/27/2019	111.73935	107.4167243	103.2877457	99.34263776	95.57217874	91.9676647	88.52087686	85.22405157	82.06985217
181016A00019	10/18/2018	3.32	10/16/2023	10/18/2018	101.72706	100.9315013	100.1483934	99.37744261	98.61836707	97.87089365	97.13475757	96.409702	95.69547787
190917A00033	1/10/2020	2.03	1/10/2023	1/10/2020	100.055	100.0244665	99.99396316	99.96349479	99.93306135	99.90266278	99.87229902	99.84196999	99.81167563
160729A00017	7/31/2017	2.47	7/31/2029	7/31/2017	112.0861	105.4834906	99.31728973	93.55633626	88.17185272	83.13724916	78.42794595	74.02121188	69.89601607
180201A00022	2/1/2018	2.99	2/3/2025	2/1/2018	104.55234	102.4679148	100.4355331	98.45354287	96.52035923	94.63445941	92.79437963	90.99871231	89.24610353
180518A00071	5/25/2018	3.56	5/18/2026	5/25/2018	110.17777	106.7439338	103.4368732	100.2512408	97.18194527	94.22413565	91.37318884	88.62469752	85.974459
170327A00078	3/27/2019	3.04	3/27/2026	3/27/2019	107.98669	104.7295398	101.5884009	98.558439	95.63505175	92.81385868	90.09068878	87.46156893	84.92271304
190530A00049	5/30/2019	2.44	5/30/2023	5/30/2019	100.63653	100.2201116	99.8071232	99.39752668	98.99128052	98.58834382	98.18867634	97.79223851	97.39899138
180403A00024	4/3/2018	2.96	4/3/2023	4/3/2018	100.54716	100.2870967	100.0283845	99.77100839	99.51495799	99.26022308	99.00679353	98.75465932	98.50381052
180515A00022	5/15/2018	3.19	5/15/2023	5/15/2018	100.85799	100.4820759	100.1089742	99.73865057	99.37107397	99.00621382	98.64404	98.28452284	97.92763308
190829A00028	8/29/2019	1.78	8/29/2024	8/29/2019	101.33908	99.7055065	98.10584746	96.53911489	95.00435492	93.5006505	92.02711967	90.58291381	89.16721609
190917A00030	1/10/2020	2.03	1/10/2023	1/10/2020	100.055	100.0244665	99.99396316	99.96349479	99.93306135	99.90266278	99.87229902	99.84196999	99.81167563

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
180328A00015	3/28/2018	2.93	3/28/2023	3/28/2018	100.5092	100.2656918	100.0233644	99.78220608	99.54220858	99.30336353	99.06566267	98.82909784	98.59366093
190621A00034	6/21/2019	2.17	6/15/2023	6/21/2019	100.56288	100.1031273	99.64757793	99.19617675	98.74886719	98.30559367	97.86630165	97.43093753	96.99944872
190520A00048	5/20/2019	2.53	5/20/2024	5/20/2019	102.021	100.6491448	99.30225129	97.97969993	96.68088815	95.40523277	94.15216929	92.92115112	91.71164889
191002A00042	1/13/2020	1.76	1/13/2023	1/13/2020	100.05951	100.0206528	99.98184488	99.94308475	99.90437227	99.86570735	99.8270899	99.78851982	99.74999702
190426A00023	4/26/2019	2.91	6/24/2026	4/26/2019	108.27335	104.7731408	101.4060882	98.16641103	95.04861279	92.04746422	89.15798894	86.37544975	83.69533581
180727A00017	7/27/2018	3.16	7/27/2023	7/27/2018	101.22448	100.6488637	100.0797867	99.51713817	98.96080958	98.41069489	97.86669042	97.3286948	96.79660886
180312A00014	3/12/2018	3	3/13/2023	3/12/2018	100.45263	100.2504629	100.0491249	99.84860682	99.64890354	99.45001006	99.25192143	99.05463271	98.85813903
200131A00029	1/31/2020	1.78	10/31/2024	1/31/2020	101.62167	99.81839372	98.05565283	96.33230102	94.64723581	92.99939237	91.38774198	89.81129058	88.26907742
150601A00677	6/1/2015	2.39	1/30/2025	6/1/2015	103.62796	101.556253	99.53627721	97.5663918	95.64502417	93.77066307	91.94185562	90.15720464	88.41536599
160211A00034	2/11/2016	1.82	2/10/2023	2/11/2016	100.15974	100.0433342	99.92721179	99.8113715	99.69581228	99.58053306	99.46553279	99.35081045	99.23636498
160714A00018	9/6/2016	2.28	9/4/2026	9/6/2016	106.54752	102.8854711	99.36927479	95.99230048	92.74825951	89.63118544	86.63541549	83.75557307	80.9865515
170609A00052	6/11/2018	2.9	6/9/2027	6/11/2018	111.05947	106.5570146	102.2650239	98.1725603	94.26931098	90.54554901	86.99209701	83.60029328	80.3619602
160222A00005	2/22/2016	2.79	2/22/2028	2/22/2016	112.17813	106.9573022	102.0134856	97.33049019	92.89315768	88.68729194	84.69959254	80.91759334	77.32960562
180625A00012	6/25/2018	3.07	6/23/2023	6/25/2018	101.01628	100.5335413	100.0554196	99.58184598	99.11275561	98.64808502	98.18777191	97.73175514	97.2799747
160303A00020	3/3/2016	2.97	3/3/2031	3/3/2016	120.04425	111.562187	103.7558548	96.56757482	89.9448827	83.84003423	78.20955747	73.0138495	68.21681325
190621A00037	6/21/2019	2.21	5/15/2024	6/21/2019	101.55073	100.1957753	98.86526828	97.55860093	96.27518821	95.01446375	93.77587918	92.55890332	91.36302161
130211A00026	2/11/2013	2.27	2/15/2023	2/11/2013	100.22814	100.0978693	99.96794954	99.83837982	99.70915869	99.5802847	99.45175644	99.32357249	99.19573144
141117A00011	11/17/2014	3.81	11/17/2034	11/17/2014	132.56308	120.0841012	108.9618688	99.0392529	90.17816552	82.25716293	75.1693602	68.82061641	63.12795405
180123A00067	1/23/2018	2.67	1/23/2023	1/23/2018	100.16267	100.0960213	100.0294733	99.96302568	99.89667807	99.83043028	99.76428209	99.69823327	99.6322836
191002A00045	2/14/2020	1.75	2/14/2023	2/14/2020	100.15935	100.0319044	99.90479848	99.77802864	99.65159354	99.52549183	99.39972217	99.27428321	99.14917362
170327A00077	3/27/2019	2.74	3/27/2024	3/27/2019	101.97158	100.7411958	99.54045515	98.3682933	97.22369883	96.10570755	95.01339976	93.94589774	92.90236335
181031A00070	3/1/2019	3.77	3/1/2029	3/1/2019	119.70663	113.2689992	107.2285322	101.5584898	96.23407943	91.23229879	86.53179713	82.11274799	77.9567324
160524A00015	11/25/2016	2.71	11/25/2026	11/25/2016	108.75281	104.8306312	101.0725925	97.47098118	94.01848373	90.7081661	87.5334522	84.48810353	81.56620006
190805A00031	8/5/2020	1.77	8/4/2023	8/5/2020	100.42485	99.83034255	99.24285266	98.66225874	98.08843992	97.52127811	96.96065798	96.40646684	95.85859456
150601A00998	6/1/2015	5.37	10/25/2034	6/1/2015	149.49489	136.1232145	124.1704745	113.4748572	103.893941	95.30227307	87.58926337	80.65734836	74.42039089
180104A00016	1/4/2018	2.56	1/4/2023	1/4/2018	100.03209	100.0182066	100.0043339	99.99047473	99.97662917	99.96279716	99.94897866	99.93517366	99.92138213
160307A00029	3/7/2016	3.21	3/7/2031	3/7/2016	120.09182	111.6836492	103.9426841	96.81212122	90.24028405	84.18013551	78.5888385	73.42736017	68.66011548
081028A00036	10/30/2008	4.22	10/30/2023		102.55065	101.7139713	100.8909472	100.0812564	99.28457765	98.50059885	97.72902193	96.96955812	96.22192174
180406A00015	4/10/2018	2.61	4/10/2028	4/10/2023	114.08237	108.8578123	104.4407287	101.2057841	99.62232825	99.15746324	98.88173873	98.61110746	98.3419887
180925A00059	9/25/2018	3.01	9/25/2028	9/25/2023	117.36031	111.550278	106.5087412	102.4356392	99.62295283	98.08025534	97.24495203	96.56062594	95.8912601
190522A00029	5/22/2019	2.41	5/22/2024	5/22/2023	102.10581	100.8756843	99.97923064	99.42655469	99.02166779	98.63909034	98.25991464	97.88363956	97.51025449
190523A00048	5/23/2019	2.32	5/23/2024	5/23/2023	102.01156	100.7930764	99.92234333	99.38641159	98.9835814	98.59858633	98.21689477	97.83814489	97.46232249
190613A00024	6/13/2019	2.18	6/13/2024	6/13/2023	101.9572	100.7015314	99.79803633	99.21150664	98.75355277	98.31510968	97.88100766	97.45071684	97.02422251

	Parallel-Shift Sensitivity Analysis												
12/30/2022					Price								
REFERENCE	SETTLEMENT	Rate	MATURITY	First/Next	-400	-300	-200	-100	Base	100	200	300	400
200131A00023	1/31/2020	1.56	1/31/2025	1/31/2023	102.27484	100.6840475	99.96533485	99.81745272	99.72937035	99.64182622	99.55414706	99.46665045	99.37930156
200207A00008	2/7/2020	1.35	2/7/2025	2/7/2023	102.29959	100.6867737	99.95266765	99.78680496	99.67927104	99.57226846	99.46529161	99.35857918	99.25210433
200221A00041	2/21/2020	1.53	2/21/2025	2/21/2023	102.27658	100.6396516	99.88703369	99.68819621	99.5428934	99.39811649	99.25369586	99.10971021	98.9661489
200227A00025	2/27/2020	1.09	2/27/2025	2/27/2023	101.88147	100.366819	99.79398062	99.61399268	99.4520957	99.29073881	99.12989551	98.96957484	98.80977302
200303A00035	3/3/2020	0.81	3/3/2025	3/3/2023	101.48643	100.166258	99.71313901	99.52804259	99.35555319	99.18377689	99.01235748	98.84156106	98.6713679